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Guidance for Implementing the RCRA Dioxin Listing Rule

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GUIDANCE FOR IMPLEMENTING THE RCRA DIOXIN LISTING RULE

AUGUST 1985

OFFICE OF SOLID WASTE AND EMERGENCY RESPONSE
U.S. ENVIRONMENTAL PROTECTION AGENCY
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This document is the producer of the U.S. EPA's Dioxin Work Group which was assigned the responsibility of developing implementation guidance for the RCRA/CERCLA response to the final dioxin listing rule. The objective of this plan is to supply the Regions, authorized States, and Headquarters with guidance on implementing the RCRA listing of wastes containing particular chlorinated dibenzo-p-dioxin (CDDs) and chlorinated dibenzofurans (CDFs).

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TABLE OF CONTENTS

Page Number

EXECUTIVE SUMMARY i

1.0 INTRODUCTION 1-1

2.0 OBJECTIVES 2-1

3.0 MAJOR ISSUES 3-1

- 3.1 Waste Management Capacity 3-2
- 3.2 CERCLA Response at On-Going and Future Actions 3-7
- 3.3 CERCLA Response -- Completed Actions 3-10
- 3.4 Compliance With Notification Requirements 3-11
- 3.5 Handling "Vertac" Rule Sites 3-13
- 3.6 Analytical Support 3-16
- 3.7 National Dioxin Strategy Activities 3-18
- 3.8 Listing of Other Waste Streams 3-20
- 3.9 Handling Wood Treatment Facilities 3-21

4.0 ATTACHMENTS

A. Dioxin Listing Rule Summary

B. Final Dioxin Listing Rule, Federal Register, Vol. 50, No. 9

C. Disposal of Dioxin Wastes

D. Certifying Incinerators and Thermal Treatment Units

E. Procedures for Planning and Implementing Off-Site Response Actions

F. CERCLA Compliance With Other Environmental Statutes

G. Laboratory Evaluation of Method 8280

i.b

EXECUTIVE SUMMARY

The final dioxin listing rule (DLR) was promulgated on January 14, 1985. This regulation designates certain wastes containing particular chlorinated dibenzo-p-dioxins (CDDs), chlorinated dibenzofurans (CDFs), and chlorinated phenols as acute hazardous wastes. The rule also establishes new, stringent RCRA management standards for these wastes.

On July 15, 1985, the final DLR became effective. The rule requires that all persons who generate, transport, store, or dispose of the listed wastes must notify the EPA or authorized State by April 15, 1985, and facilities that intend to continue handling these wastes must submit a Part A application by July 15. Even facilities that have submitted Part A applications previously (i.e., that qualified as interim status facilities under RCRA) must re-submit a Part A application to be qualified as an interim status facility under the DLR.

The objective of this document is to supply the Regions, authorized States, and Headquarters with guidance on implementing the RCRA listing of CDDs and CDFs. Major response issues for the RCRA and CERCLA programs have been investigated and consensus positions established by the various Headquarters offices on these issues. These issues and proposed resolutions are summarized below.

Waste Management Capacity - Lack of approved treatment and disposal capacity for the listed wastes is the primary issue of concern. The guidance calls for expedited Regional certification and permitting of facilities able to meet the requirements of the DLR. To assist the Regions in these efforts, Headquarters staff have developed permitting/certification guidances and are available for consultation. Until such time that approved treatment and disposal capacity is available, secure on-site containment of the listed wastes is encouraged. Meanwhile, various demonstration projects are being supported to aid the development of dioxin treatment and disposal.

CERCLA Activities -- On-Going And Future Activities - Adherence to DLR requirements at CERCLA sites where the listed wastes may be present has the potential to affect site progress. The guidance calls for the identification of sites where the listed wastes are present and the adjustment of responses to account for the acute hazardness of these wastes. In accordance with "CERCLA

Compliance With Other Environmental Statutes" (Attachment F), the appropriate adjustment will vary depending on the nature of the response (i.e., removal, PA/SI, RI/FS, ROD, RD, RA). Sites where the listed wastes are known or suspected to be present need not (but may) receive preferential treatment at the discretion of the Region or State.

CERCLA Activities -- Completed Actions - Regions need to identify, evaluate, and where necessary, address completed removal or remedial actions where additional actions may be warranted. The guidance calls for review of available data bases to identify candidate sites and reevaluation of the response taken in terms of its adequacy in protecting human health and the environment. The intention, in this regard, is to respond prudently without unduly constraining progress with on-going and future cleanup needs.

Compliance With Notification Requirements - The DLR calls for notification by all facilities which handle the listed wastes. OWPE is developing a mechanism to detect non-notifiers and enforcement policies/procedures to ensure compliance with the DLR.

Handling "Vertac" Rule Sites - When the DLR became effective on July 15, 1985, previous regulations on the disposal of waste materials containing 2,3,7,8-TCDD under the Toxic Substances Control Act were revoked. Approximately 70 sites notified EPA under the provisions of this rule. These facilities now fall under the domain of the RCRA and CERCLA programs (they have been notified of the DLR). The Regions and States have been advised that they should evaluate these facilities on a site-specific basis and determine the adequacy of their waste management practices in terms of the DLR requirements and the protection of human health and the environment.

Analytical Support - Method 8280, developed to support the DLR, has not been validated for all the waste matrices of concern. Multilab validation is scheduled to be completed by December 31, 1985. High priority, immediate analytical needs can be met through the few capable private laboratories that are available. The Methods Development Branch (OSW) will provide additional information through periodic newsletters.

National Dioxin Strategy (NDS) Activities - To date, the NDS has generally focused on the most toxic dioxin isomer -- 2,3,7,8-TCDD. Plans to sample and analyze other dioxin isomers now regulated have not been implemented. At issue is whether these plans should be implemented now.

The guidance provides that the Regions should begin sampling and analyzing for the additional homologues in the post-August time frame. EPA Regional RCRA/CERCLA personnel are advised to utilize NDS activities and data in their efforts to implement the DLR.

Listing Of Other Waste Streams - There are waste streams not listed by the DLR that contain or may contain the dioxin or furan constituents of concern. At issue is how these non-listed waste streams are to be viewed within the CERCLA program. The guidance recommends the conservative approach of viewing materials containing tetra-, penta-, or hexachlorinated dioxins or furans as acute hazardous wastes, subject to the DLR requirements, regardless of whether they are explicitly listed under the DLR.

Handling Wood Treatment Facilities - This is a special case of the preceding issue. PCP wastes from wood treatment, although known to contain hexachlorodioxins, are not generally regulated under the DLR. Nonetheless, the guidance recommends a conservative approach of viewing PCP wastes containing tetra-, penta-, or hexachlorinated dioxins or furans as acute hazardous wastes subject to the DLR requirements. As with other dioxin sites, however, the Regions or States are free to assign appropriate response priority to these sites.

These issues and their resolution are explored further in Chapter 3 of this guidance.

1.0 INTRODUCTION

The final dioxin listing rule (DLR) was promulgated on January 14, 1985. This regulation designates certain wastes containing particular chlorinated dibenzo-p-dioxin (CDDs), chlorinated dibenzofurans (CDFs), and chlorinated phenols as acute hazardous wastes. The rule also establishes stringent RCRA management standards for these wastes.*

On July 15, 1985, the final DLR became effective. The rule requires that all persons who generate, transport, store, or dispose of the listed wastes must notify the EPA or authorized state by April 15, 1985, and facilities that intend to continue handling these wastes must submit a Part A application by July 15. Even facilities that have submitted Part A applications previously (i.e., that qualified as interim status facilities under RCRA) must re-submit a Part A application to be qualified as an interim status facility under the DLR.

The U.S. EPA's Dioxin Work Group (DWG) was assigned the responsibility of developing implementation guidance for the RCRA/CERCLA response to the DLR. This document is the product of their work and that of the various program offices:

- Office of Emergency and Remedial Response (OERR)
- Office of Solid Wastes (OSW)
- Office of Waste Programs Enforcement (OWPE)**.

The objective of this plan is to supply the Regions, authorized States, and Headquarters with guidance on implementing the RCRA listing of CDDs and CDFs. Major response issues for the RCRA and CERCLA Programs have been investigated and consensus positions established by the various Headquarters offices on these issues. The process undertaken:

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* See Attachment A for a summary of the rule, and Attachment B for a copy of the final Federal Register announcement.

** Support for the development of this document was provided by Booz, Allen & Hamilton (Contract No. 68-01-6808).

- Established overall response strategy objectives
- Provided an orientation to issues requiring resolution
- Sought input from Regions and States on unresolved issues and the feasibility (including resources) of the response strategies
- Highlighted areas where Regions and States might need to adjust resources, priorities, and commitments, and
- Identifies additional guidance that is or will be available to aid implementation of the DLR.

Chapter 2.0 discusses the general response strategy objectives that guided the development and selection of issue-specific response strategies. The consensus response strategies developed by OSWER and other EPA staff are presented, by issue, in Chapter 3.0. The major issues considered include:

- Waste management capacity
- CERCLA response at on-going and future actions
- CERCLA response to completed actions
- Compliance with notification requirements
- Handling "Vertac" rule sites
- Analytical support
- National Dioxin Strategy activities
- Listing of other waste streams
- Handling wood treatment facilities.

For each issue, relevant citations from the proposed or final rule are included along with a synopsis of the response issue and a summary of the EPA response strategy, a discussion of outstanding questions requiring resolution, and a schedule (if applicable) for required actions.

Chapter 4.0 contains several attachments pertinent to or referenced in the plan, including all final guidance developed by the Agency to date.

* * * * *

Each of the consensus response strategies developed take, as their basis, several general or overall response objectives for implementation of the DLR within the RCRA and CERCLA programs. These general objectives, established early in the development of the implementation guidance, are reviewed in the next chapter.

2.0 OBJECTIVES

Among the questions or issues raised by the DLR for the RCRA and/or CERCLA programs are these:

- Who are the generators and handlers of these listed wastes?
- How should the Agency deal with inactive and active waste sites where these listed wastes are or may be present?
- Which facilities qualify as able to manage these listed wastes properly under the standards set?
- Can the listed CDD- and CDF-containing wastes be detected reliably and to what limits in a variety of waste matrices?
- How should the Agency approach releases or potential releases of non-listed wastes that may contain CDDs and/or CDFs?

This guidance reflects two major management objectives: 1) to bring CDD- and CDF-containing wastes into the RCRA/CERCLA program "mainstreams" to the greatest extent possible; and 2) is to ensure that the implementation response is a coordinated one.

In developing this guidance, EPA staff have also applied other criteria such as the following:

- Consistency with the status of these wastes as acute hazardous wastes*
- A reasonable, prudent sensitivity to public concerns surrounding CDD- and CDF-containing wastes.

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* Except for treatment (e.g., incineration) residues from soils that are considered toxic wastes (unless de-listed) under the final rule (see Attachments A and B).

- Recognition of current technical limits especially as they pertain to waste management capacity and analytical support
- Consistency with other EPA program policies and regulations (including other RCRA and CERCLA policies)
- Efficiency in the use of limited program resources to meet program objectives.

Application of these criteria has been an explicit or implicit part of the consensus building process.

Community relations and public relations are important to the dioxin disposal strategy. EPA Headquarters community relations and public relations staff are available to work with Regional offices in the education of elected officials and the public regarding issues such as the efficacy of incineration and the need for and safety of on-site storage pending the development of disposal capacity.

* * * * *

In Chapter 3.0 each of nine major response issues are discussed. A brief synopsis of each issue is presented along with a relevant citation from the final or proposed DLR (either taken from the preamble or the regulation itself), and management guidance or resolution of the issue.

3.0 MAJOR ISSUES

Discussions within the DWG and among the OSWER program offices led to the identification of nine major implementation issues for which guidance appeared necessary. These issues are:

- Waste management capacity*
- CERCLA response at on-going and future actions
- CERCLA response -- completed actions
- Compliance with notification requirements
- Handling "Vertac" rule sites
- Analytic Support
- National Dioxin Strategy activities
- Listing of other wastes streams
- Handling wood treatment facilities.

These issues are reviewed in the following sections of this chapter. Each section presents a relevant citation from the final or proposed DLR, a synopsis of the issue, and relevant guidance or issue resolution.

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* Includes issues of certification guidance, waste management plan guidance, de-listing guidance, and the impact of the land disposal restrictions program.

3.1 Waste Management Capacity

> "The Agency continues to believe that, for these wastes, management in fully permitted facilities is preferrable... At the same time, the Agency is concerned about possible shortages in short-term management capacity for these wastes... We believe that certain types of interim storage facilities can provide adequate management in the short term. Other interim status facilities... can be evaluated for compliance with the Part 264 standard... and... should not be prohibited from managing these wastes."*

3.1.1 Synopsis of the Issue

The RCRA program is concerned with ensuring that only qualified facilities receive the listed waste, and that sufficient guidance is available to establish those facilities that are qualified. Both the RCRA and CERCLA programs are concerned that capacity exists to handle these wastes to allow clean-up programs to move forward. RCRA will be performing cleanup under Closure/Post Closure Permitting and as part of Corrective Action at Solid Waste Management Units (SWMU). CERCLA is concerned with the entire range of cleanup activities at Superfund sites. These perspectives are reflected in the following list of individual issues under the larger concern about capacity:

- The need to "fast track" certification or permit applications to handle CDD and CDF-containing wastes and the responsibility for certification of qualified interim status facilities

- The availability of short-term options to handle these wastes until sufficient certified or permitted capacity is on-line

- The ability of the Agency to encourage capacity development

- The availability of guidance on acceptable waste management plans for permitted land disposal facilities

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* See Attachments A and B for a characterization of interim status facilities that would be allowed to accept these wastes.

- The development of de-listing or downgrading (e.g., from an acute hazardous waste to a toxic hazardous waste) policies and procedures for the listed wastes, especially for treatment residues*
- DLR requirements allow for land disposal of the listed wastes at fully permitted facilities; however, the Hazardous and Solid Waste Amendments land disposal ban evaluation may impose restrictions on the land disposal of dioxin wastes. This fact may discourage land disposal facilities from seeking permits.

These issues are addressed individually below.

3.1.2 EPA Response Strategy

The following response strategies correspond to the seven disposal capacity issues raised:

- Certification - Every effort should be made by the Regions, authorized States, and EPA Headquarters to accelerate processing of applications to treat, store, or dispose of dioxin-containing wastes. This need has been reinforced by a recent memorandum (April 10, 1985) issued by the EPA Administrator (see Attachment C). In addition, the OSW certification guidance seeks to ensure that processing of applications is as rapid as reasonable within the context of the DLR requirements specified (i.e., meeting the technical criteria and the 60-day comment period).
- The Regional offices will take the lead in certification activities and will prepare the package for AA/OSWER signature. The Permits Branch, OSW, has drafted guidance for both certification and permitting of facilities seeking to handle the DLR listed wastes (see Attachment D). The guidance provides for as rapid a consideration of applications as possible certification. Headquarters Permits Assistance Team (PAT) team will be available to provide assistance, and will review certification packages for national consistency. If necessary, the Region will provide a briefing for the AA/OSWER for final certification decision. Since the dioxin certification for interim status incinerators or alternate thermal treatment facilities are likely to require a significant fraction of the resources that would have to be devoted to a full RCRA Permit, the FY 1986 RCRA Implementation Plan reporting system will be modified to reflect

credit for this effort, when a Region delivers a formal certification recommendation to the AA/OSWER.

- Short-term Capacity - Since the final rule was issued, the EPA has received several certification applications for handling dioxin-containing wastes. Even processing these applications as rapidly as possible, it is likely there will be no certified and/or permitted capacity available when the DLR becomes effective on July 15, 1985. It is expected that there may be insufficient capacity available for some time (i.e., only a few facilities and/or few facilities that can treat soils, sludges, etc.). However, certain interim status facilities can store dioxin wastes, so some capacity may be available on July 15, 1985. As discussed in the section on ongoing and future cleanup actions (Section 3.2), lack of ultimate disposal capacity should not discourage appropriate containment and/or on-site storage. During the interim period therefore, a case-by-case evaluation of contaminated sites is recommended, applying the following guidelines:

  - In cases where there is known or suspected off-site migration of the waste and threats to public health and the environment, containment measures should be implemented (e.g., capping, excavation and drumming) until such time as treatment or disposal capacity is available.

  - In cases where there is no off-site migration of the waste and/or no immediate threat to public health and the environment, it may be permissible to cap, restrict access, or simply monitor the site until capacity to treat, store, or dispose of the waste is available allowing further clean-up actions to proceed.

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* Except for treatment residues from the incineration of contaminated soils (considered toxic hazardous wastes under the DLR), the residues of other wastes containing dioxins are still acute hazardous wastes subject to the full DLR requirements.

- Considering the likelihood that waste disposal capacity for dioxin-containing wastes will presumably be limited to a few thermal treatment (and perhaps land disposal) facilities, it has not been decided whether incineration as the only permitted capacity option will be selected in all cases, or dioxin concentration thresholds will be set that allow for temporary storage until less expensive, permitted remedies become available. Recent agency policy from the Acting Assistant Administrator of OSWER, Procedures for planning and Implementing Off-Site Response Actions (May 6, 1985; see Attachment E) should be consulted.

- Encouraging Capacity - There are limits on Agency ability to actively encourage the development of waste management capacity for dioxins. However, there are some steps the Agency is taking that aid the climate for capacity development: developing plans for future use of EPA's mobile incinerator for dioxins disposal; checking with PCB incineration facilities for their interest in dioxin disposal; developing technical guidance as quickly as possible (especially as it pertains to the de-listing or down-grading of treatment residues); and establishing procedures that accelerate consideration of certification or permit applications. In addition, the Agency is also pursuing several research topics that may have a direct or indirect impact on the capacity issue. These include trial burns and field demonstrations of the EPA's mobile incinerator; demonstrations of transportable and erectable incinerators; demonstrations of other, private mobile incinerators and destruction technologies; field trials of the alkali polyethylene glycol reagent; feasibility of using abandoned mines as repositories for dioxin wastes; and in-situ stabilization with cementitious or asphaltic materials; and selected field trials of special biological methods to include the white rot fungus, P. chrysosporium.

- Waste Management Plan Guidance - OSW is revising the waste management plan guidance and associated background documents. In support of this effort, ORD is currently investigating the leaching potential of co-solvents and 2,3,7,8-TCDD and its mobility from contaminated soils. Land Disposal Ban Models have been completed, and will be distributed as soon as possible. Most land disposal facilities appear to be waiting for the completion of the land disposal ban evaluation. Final ban decisions will be proposed by 11/85 and finalized by 11/86.

- Delisting Guidance - OSW has developed general guidance for de-listing petitions (Federal Register 1/26/85). OSW has submitted for Red Border review a proposal to downgrade residues from incineration. Additional provisions which would allow complete de-listing are under consideration.

- Land Disposal Ban - Land Disposal Ban Decisions may affect wastes in addition to those containing dioxins and furans. As a matter of general policy, OSWER has decided to process applications for permits as they are received in the expectation that whatever ban and/or treatment requirements that develop later can be incorporated in these permits. This policy will also apply to implementation of the DLR. It is unclear at this time whether any land disposal facilities will seek permits for dioxin disposal.

3.2 CERCLA Response at On-Going and Future Actions

> "...the proposed rule is slanted toward prevention of future accidental releases of CDDs and CDFs to the environment... do not agree that this rule will significantly hinder or prevent cleanup of existing contaminated sites... major waste that is generated at these sites... is soil contaminated with CDDs and CDFs... The Agency developed a strategy for dealing with dioxin which, among other things deals with alternatives for cleanup [including] securing the soil in place, novel remediation techniques, incineration, and removal of soil to a secure containment system"
>
> "...all hazardous wastes designated under RCRA will have an RQ [Reportable Quantity] of one pound, until adjusted by regulation under CERCLA... for dioxin-containing wastes... a one pound RQ shall be assigned upon promulgation of this rule... Therefore, if a person were to spill one pound of any of the wastes covered by... [this] rule, he would need to notify the NRC [National Response Center] of the release, unless the person determines that there is less than an RQ of each hazardous constituent in the waste... EPA can take response, cleanup, and other actions below RQ levels... [There] may be instances where EPA would need to know of releases well below the one pound RQ level."

3.2.1 Synopsis of the Issue

Under the RCRA DLR, a removal or remedial action under CERCLA involving the listed wastes should comply with the waste management standards of the rule. A secondary issue is the need to adjust the statutorily set Reportable Quantity (RQ) for the listed wastes.

3.2.2 EPA Response Strategy

On-going and Future Removal Actions: For future and on-going removal actions, emergency response personnel in the Regions and authorized states need to adjust their procedures for responding to releases to account for the acute hazardousness of the listed wastes. Prioritizing responses to these sites vis-a-vis other sites is, however, at the discretion of the Regions and authorized states. Removal actions concerning a release or potential release of the listed wastes are to follow recent guidances on "CERCLA Compliance with Other Environmental

Statutes" and "Procedures for Planning and Implementing Off-Site Response Actions" (Attachments F and E, respectively).

Meanwhile, Headquarters is evaluating the appropriateness of the statutory RQ set for acute hazardous wastes as part of their evaluation of 250 RQs for next year's rulemaking. However, as noted in the regulation, EPA may respond to releases or potential releases of lower quantities than the RQ.

On-going and Future Remedial Actions: Regions and authorized states should make a reasonable effort to identify, and adjust a response as appropriate to comply with the DLR, at sites where the listed wastes are known to be present, or if site screening information (see Section 3.3, CERCLA Response -- Completed Actions, for a discussion of site screening information) indicate that these wastes are likely to be present. It is believed that information assembled for the Tier 1 and 2 National Dioxin Strategy investigations may capture a significant proportion of the disposal sites of interest. Due to the specific conditions encountered at remedial response sites, it is not feasible to set general criteria or "action levels" for dioxin-contaminated sites. In accordance with "CERCLA Compliance With Other Environmental Statutes" (Attachment F), an appropriate adjustment will vary with the stage of the remedial response:

- If the site is in the Remedial Investigation/Feasibility Study (RI/FS) stage and the remedy has not been selected, additional sampling and analysis may be appropriate. If the listed wastes are detected, the FS report must include an alternative that meets the technical requirements of the DLR.
- If the FS is complete and a Record of Decision (ROD) has been drafted, but not signed, the decision-maker may need to reevaluate the recommended alternative if evidence indicates that the listed wastes are present and the remedy appears inappropriate.
- If the remedy has been selected, that remedy should be reviewed if the listed wastes will persist on site and pose a threat to public health and the environment.

Future remedial actions sites where the listed wastes are known or suspected to be present (based on site screening information) should be sampled for the CDDs and CDFs of concern. If positively identified, remedial planning activities must include the development and evaluation of a remedy that meets the requirements of the rule. Sites where the listed wastes are known or suspected to be present need not (but may) receive preferential treatment at the discretion of the Region or State.

OERR recognizes that operational implementation of this guidance is somewhat limited by both the availability of certified or permitted capacity to manage the listed wastes, and the availability of analytical methods, standards, and laboratory capacity. Dioxin wastes will require on-site storage at CERCLA sites until safe disposal capacity is available. Many of these remedies will be considered as temporary until technologies are developed for treating or disposing of these wastes properly. If the remedy is considered to be interim in nature, language to that effect should be included in the decision document.

3.3 CERCLA Response -- Completed Actions

3.3.1 Synopsis of the Issue

Information is needed to identify, evaluate, and where necessary, address completed removal or remedial actions where additional actions may be warranted. The intention, in this regard, is to respond prudently without unduly constraining progress with on-going and future cleanup needs.

3.3.2 EPA Response Strategy

Removal action site screening information has been developed that will identify candidate CERCLA sites where the listed wastes and dioxin/furan constituents may have been present. The Emergency Response Division (ERD) has compiled a preliminary list of ~~126~~ removal actions which merit review. The list will be distributed to the Regions for further consideration. Project Officers will review and revise the list based on relevant considerations and information not available in the Removal Action Data Base. Such information might include, for example, whether there was an indication of PCB burning at the site. High levels of furans are associated with improper burning of PCBs.

Completed remedial actions which may involve the listed wastes or constituents may be identified through review of completed RI/FS Reports, Final Technical Reports, etc. However, as stated previously, it is believed that information assembled for the Tier 1 and 2 National Dioxin Strategy investigations may capture a significant portion of the disposal sites of interest. Once a candidate site is identified, the response taken at the site should be reevaluated for its adequacy in protecting human health and the environment. Unfortunately, site-specific conditions make it infeasible to set general criteria or "action levels."

3.4 Compliance With Notification Requirements

> "All persons (including those who have previously notified the Agency under Section 3010 of RCRA) who generate, transport, treat, store, or dispose of the wastes listed... are required to notify EPA or a state authorized by EPA ...no later than April 15, 1985... All existing hazardous waste management facilities... which treat, store, or dispose of wastes listed... and which qualify to manage these wastes under interim status... must file with EPA or a [authorized] State... a notification by April 15, 1985 and a Part A permit application by July 15, 1985... Facilities which have already qualified for interim status will not be allowed to manage the waste listed... after July 15, 1985 unless: (1) the regulation allows them to handle such wastes under interim status, (2) they file a notification... by April 15, 1985, and (3) they submit an amended Part A permit application... by July 15, 1985."

3.4.1 Synopsis of the Issue

As indicated above, the Regions, authorized states, and/or EPA Headquarters have received or will be receiving notifications and Part A permit applications from generators and other handlers of the listed wastes. Compliance with these notification requirements must be monitored. This will require some mechanism to detect non-notifiers and enforcement policies and procedures to ensure compliance.

3.4.2 EPA Response Strategy

EPA has already taken steps to reach the regulated community with information on the requirements to be imposed under the DLR. OSW, for example, has provided actual notice of the RCRA DLR with applicable dates and a copy of regulation to Vertac notifiers in an information package sent out in the first week of April 1985. In addition, OSW has worked through several trade associations to notify their members of the notification requirement. A number of EPA Regions have also elected to notify facilities potentially subject to the listing.

The mechanism proposed to aid the Regions and states in detecting possible non-notifiers is to distribute a list of subject facilities compiled from a variety of sources. OSW compiled a list of affected facilities as part of the regulation development process. This list was derived from a pesticide registrants (FATES) data base maintained by the Office of Pesticides and Toxic Substances (OPTS), and is considered to include all facilities that registered to handle these materials (i.e., pesticides). The list needs to be updated to reflect current knowledge of active and inactive facilities that actually handled the listed wastes, and improved to provide addresses and phone numbers.

In handling non-notifiers detected from cross-comparisons of these lists, OWPE advises the Regions and states to determine whether the facility or generator was, in fact, liable to notify. If so, the Regions or States should consider non-notification as a case of non-compliance and initiate an appropriate action based on the circumstances.

3.4.3 Outstanding Issues or Actions

To implement the recommended response strategy, the following steps must be taken:

- The FATES data base list developed to support the DLR will be refined and distributed to the Regions by August 30. Any questions regarding this list should be directed to Gerald Kotas (FTS 382-4844).
- Regions and authorized states need to pursue appropriate enforcement actions against facilities and generators who were subject to the notification requirement, but did not notify by April 15, 1985.

16

3.5 Handling "Vertac" Rule Sites

> "Therefore, when the RCRA dioxin waste rules are effective, and the TCDD-contaminated wastes are controlled under RCRA, their disposal will no longer pose an unreasonable risk finding under TSCA. Consequently, we.. revoke the TSCA rule (Section 6a and those that require a sixty-day notification to EPA [by] persons wishing to dispose of TCDD-contaminated wastes) when the rule, under RCRA, becomes effective."

3.5.1 Synopsis of the Issue

When the RCRA dioxin listing rule becomes effective on July 15, 1985, previous regulations on the disposal of waste material containing 2,3,7,8-TCDD* under the Toxic Substances Control Act (TSCA) will be revoked. This regulation (40 CFR Part 775), informally known as the Vertac rule, established:

- A prohibition against the removal for disposal of wastes containing TCDD produced before May 12, 1980 from the Vertac Chemical Company facility in Jacksonville, Arkansas.
- A requirement that wastes containing TCDD produced by the Vertac Chemical Company Jacksonville facility after May 12, 1980, had to be tested (40 CFR 775.197(c)), and if found to have detectable levels of TCDD, had to be disposed at facilities that complied with the requirements of Section 761.41(b).
- A requirement that any person who disposes of chemical substances or mixtures for commercial purposes who wishes to dispose of wastes containing TCDD had to give 60 days prior notification of that intention to the Assistant Administrator of EPA.

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* These wastes were defined as "any waste material or waste(s) resulting from the manufacture or processing of 2,4,5-trichlorophenol or its pesticide derivatives, or any waste(s) resulting from manufacturing processes using equipment that was at some time used in the manufacture of 2,4,5-trichlorophenol or its pesticide derivatives."

Approximately 70 sites (including the Vertac facility) notified EPA under the provisions of this rule. These sites will now fall under the domain of the RCRA and CERCLA programs with revocation of the TSCA rule. Some of these sites are already on the CERCLA National Priorities List (NPL).

The transition of responsibility for these sites from the TSCA to the RCRA program must be a smooth one, yet there are questions concerning some of the details. These questions include:

- How should these sites be assessed and characterized (e.g., as storage or disposal sites)?
- How should prior EPA disposal recommendations be handled?
- How should the potential for needed clean-up at these sites be determined?
- Should these sites be given priority and/or preferential treatment if they apply for RCRA permits?

Complicating the transition task is the variety of different "disposal" situations among all the "Vertac" rule sites or, in some cases, at individual sites. At the Vertac facility itself, for example, TCDD wastes can be found in underground cells, in drums on the land surface, or in soils paved over with asphalt. Each of these situations may warrant a different response.

3.5.2 EPA Response Strategy

The EPA has notified all those facilities that reported under the Vertac rule of the requirements of the RCRA DLR. Monitoring of active TSD facilities is the responsibility of Regional and/or authorized State RCRA program personnel. Prior EPA disposal recommendations for these facilities must be evaluated on a site-specific basis by the Regions. The Regions should determine the adequacy of past recommendations in meeting the requirements of the DLR and for protecting human health and the environment. The Regions should employ the following guidelines in making these determinations:

- Responses to "Vertac" rule sites or parts thereof, where the listed wastes are stored above ground (e.g., drums) should be directed at compliance with all aspects of the DLR (i.e., qualify under interim status, obtain a RCRA permit or properly dispose of the waste off-site).

- "Vertac" sites, or parts thereof, where the listed wastes have been buried are to be considered "interim disposal" sites. These situations are to be handled on a site-specific basis and should be highlighted for possible corrective action orders under the Hazardous and Solid Waste Amendments (HSWA) if the facility applies for a permit. It should be understood that future (permanent) disposal actions may be required.

- Determining the need for clean-up activity at these sites should be based on considerations of relative health and environmental risks. For example, in some cases it may be less risky to leave paved-over contaminated soils undisturbed as opposed to excavating these soils for off-site or on-site treatment, storage, or disposal.

- Prioritization of response activities (e.g., permitting, certifying, inspecting, excavating, capping) at "Vertac" facilities is at the discretion of Regional or State program staff. Response activities at these sites should be weighed against other Regional and state objectives, but should also consider public sensitivity to the "dioxin" issue. In addition, the Regions should be considering corrective action orders for existing Solid Waste Management Units (SWMU) while processing permit applications.

- Headquarters staff will be available for consultation on specific sites.

3.6 Analytical Support

> "This method [Method 8280] measures the concentration of chlorinated dibenzo-p-dioxins and chlorinated dibenzofurans in chemical wastes including still bottom, filter aids, sludges, spent carbon, and reactor residues, and in soils... This method is recommended for use only by analysts experienced with residue analysis and skilled in mass spectral analytical techniques."*

3.6.1 Synopsis of the Issue

Implementation of analytical Method 8280 to support RCRA and CERCLA activities in response to the DLR hinges upon the resolution of two analytical issues -- Method Validation and Laboratory Capacity:

- Method Validation - Method 8280 must be capable of discerning the homologues of concern in a variety of matrices with high levels of chemical interferences. Single-lab validation of method 8280 was completed on May 15, 1985. Subsequent review of the method, as well as comments received from laboratories solicited for a multi-lab validation, indicated the need for further method revision, particularly for more complex matrices. [NOTE: The method does appear to give satisfactory detection limits for matrices such as soils and fly ash.]

- Laboratory Capacity - Implementation of the DLR requires the availability of analytical laboratory capacity capable of performing Method 8280. Many laboratories are familiar with the analysis of 2,3,7,8-TCDD; however, fewer laboratories have experience with the listed homologues in the variety of waste matrices anticipated with these analyses.

Until recently, the availability of reference standards necessary for Method 8280 was also a major concern. At present there are several domestic source for isotopically labeled and unlabeled standards and apparently there are other suppliers in Europe.

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* See Attachment B for a copy of the original method. Method revisions will be distributed to the Regions as they are developed.

3.6.2 EPA Response Strategy

- Method Validation - OSW will implement a two-step approach to method validation:
  - Step 1, Method familiarization by three laboratories by September 16, 1985
  - Step 2, Method evaluation by same three laboratories by December 31, 1985.
- Laboratory Capacity - OSW has determined that high priority, immediate needs can be met through the few capable private laboratories that are available. Eventually the commercial laboratory market will respond to program needs.
- The Methods Development Branch (OSW) will provide additional information on revision to the method in their periodic Newsletter (see Section 4.0, Attachment G for a memorandum on Laboratory Evaluation of Method 8280).

3.7 National Dioxin Strategy Activities

3.7.1 Synopsis of the Issue

The basic objective of the National Dioxin Strategy (NDS) is to evaluate sites where dioxin-containing wastes were produced or disposed, and to initiate appropriate remediation at contaminated sites. To date, however, the NDS has generally focused on only one of the dioxin isomers of concern -- 2,3,7,8-TCDD.* Plans to sample for other dioxin isomers have not been implemented. At issue is whether these plans should be implemented now, in light of the DLR, to provide for identifying sites where other isomers may be present, and how these plans should be implemented to obtain maximum use of NDS activities and data.

Tier sites of interest that are being or have been tested for 2,3,7,8-TCDD only include:

- Tiers 1 and 2: Sites associated with the manufacture of 2,4,5-trichlorophenol and its derivatives. (These may have produced other RCRA listed wastes as well.) EPA is currently investigating 21 facilities in these tiers.
- Tiers 1a and 2a: Sites that received wastes for disposal from Tier 1 and 2 facilities. Currently, 74 sites have been identified with preliminary screening at those sites scheduled for completion by late FY85.
- Tier 3: About 400-500 facilities where pesticidal products were formulated. Initial testing will include 100 sites with more tested as necessary depending on the initial results. Efforts to locate waste disposal facilities associated with Tier 3 sites have also been initiated.
- Tier 6: Sites where abnormal processing conditions in the production of other pesticides and chemicals may have produced dioxins. This is a small category, and perhaps 15-20 sites will be sampled. Sites that received wastes from Tier 6 facilities are also being investigated.

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* Except for the testing of sites in the so-called combustion source tier (Tier 4).

As previously mentioned it is believed that information from Tiers 1, 1a, 2 and 2a will address a significant proportion of the sites of concern to the CERCLA program with the exception of PCP wood treaters discussed below.

3.7.2 EPA Response Strategy

EPA Regional RCRA/CERCLA program personnel are advised to take steps necessary to utilize NDS activities and data in their efforts to implement the RCRA DLR.

For NDS Tiers 1 and 2, particularly in the post-August timeframe, Regions should analyze for the tetra-, penta-, and hexa- homologues from the outset of sampling.

In cases where the Regions have already analyzed for 2,3,7,8-TCDD, they may elect to reanalyze the splits for the tetra-, penta-, and hexa- homologues. Regions should be able to incorporate this effort within the framework of their existing programs; i.e., NDS data should be made part of the normal PA/SI process.

3.8 Listing of Other Waste Streams

> "...EPA expects to further investigate wastes [for listing] that are generated on contaminated equipment previously used in the production or manufacturing use of pentachlorophenol,... chlorinated benzenes and PCBs,...dichlorophenol process wastes... fly ash and emission control dusts from the low-temperature combustion of chlorophenols... and presently unlisted residues from wood preservation."

3.8.1 Synopsis of the Issue

There are other waste streams that contain or may contain dioxin or furan constituents of concern. As yet these waste streams are not listed and therefore, are not subject to the RCRA DLR. Pentachlorophenol (PCP) waste from the pesticidal treatment of wood is one example (see discussion of wood treaters below).

3.8.2 EPA Response Strategy

EPA will continue to evaluate the need to list additional waste streams on the basis of their contamination with dioxin and/or furan congeners of concern. A listing decision on PCP wood treatment wastes, for example, is expected by December 1985.

In the interim, it is recommended that the CERCLA response and enforcement programs adopt a conservative approach by viewing materials containing tetra-, penta-, or hexachlorinated dioxins or furans as acute hazardous wastes, subject to the dioxin listing rule requirements, regardless of whether they are listed under the DLR. CERCLA section 104(a) grants the Agency the authority to take such response actions. OERR and OWPE believe that nothing is gained from a less conservative approach, especially if the waste is subsequently listed under RCRA, and it becomes necessary to reevaluate (i.e., spend additional resources at) sites of completed actions. OWPE and OERR will provide additional guidance on issues which arise in implementing this policy.

3.9 Handling Wood Treatment Facilities

> "In the context of this listing, manufacturing use means the use of the named chemical as a reactant or chemical intermediate,... or as a component in a formulating process. In the present context, the term manufacturing use does not include residues from the use of chlorophenoxy pesticide formulations, e.g., [the use of PCP] in wood preservation."*

3.9 Synopsis of the Issue

PCP wood treatment wastes are generally, but not totally, excluded from the most recent listing. Formulation activities and discarded, unused formulations are covered under F021 and F027, respectively. It is important to note that "Bottom sediment sludge from the treatment of wastewaters from wood preserving processes that use creosote and/or pentachlorophenol" is covered by a separate listing - K001 (but not acutely hazardous). The question is whether the CERCLA response and enforcement programs should view the release or presence of PCP (or another non-listed, dioxin-containing waste) at an active or inactive wood treatment facility as:

- Where wastewater sludge is involved, simply a release of PCP not subject to the DLR, in effect, ignoring the presence of a dioxin isomer as a constitutent
- A release of a dioxin-containing waste subject to the DLR regardless of the current status under the rule.

These two choices have significantly different resource implications, particularly if reports that allege widespread environmental problems at wood treatment facilities are true (e.g., 65 wood treatment facilities on or proposed for the NPL).

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* Footnote 5 from the proposed listing of CDD- and CDF-containing wastes. 48 FR 14515, April 4, 1983.

3.9.2 EPA Response Strategy

OERR and OWPE concur in their opinion that the release of a non-listed waste that contains tetra-, penta-, or hexachlorinated dioxin or furan, such as a PCP release at a wood treatment facility, should nonetheless be handled conservatively as if the waste were subject to the DLR requirements. There is a strong feeling that nothing is gained from a less conservative approach especially if the waste is subsequently listed and it becomes necessary to reevaluate completed actions. As with other dioxin sites, however, the Region or authorized State is free to assign the appropriate response priority to these sites.

The Agency will assist the Regions and States in identifying these sites (both active and inactive) through its own investigations (such as the one now underway within the Discovery and Investigations Branch (DIB)) or those of the Regions or States (e.g., Oregon and California). DIB's "Discovery Analysis - Wood Preserving Industry" should be available (July 1985) from Regional Superfund Branch Chiefs. The total number of active or inactive wood treatment facilities that are contaminated with PCP and/or dioxins/furans is presently unclear. Answers to this outstanding question will have the most direct resource implications for the CERCLA program.

The RQ for PCP is being reviewed to reflect the presence of the dioxin constituent, as part of ERD's annual RQ update. The RQ for PCP is currently 10 pounds. Also left unresolved as of this date is the issue of whether a dripping log at a wood treatment facility constitutes a release as defined by CERCLA.

In conducting analyses for dioxin and furan contamination, Method 8280 or a similar method yielding ppb detection limits in soil should be employed.

3.9.3 Outstanding Issues

There are three issues left unresolved within the broader question of how to handle wood treatment facilities in light of the DLR:

- Should the RQ for PCP be changed to reflect the presence of the hexachlorinated dibenzo-p-dioxin homologue group?
- Should the one pound or 10 pounds RQ ~~provision~~ be enforced at these sites?
- Is a dripping log a release under CERCLA?

These issues will be addressed in a future RQ regulations package and a forthcoming policy statement from OWPE.

ATTACHMENT A

DIOXIN LISTING RULE SUMMARY

DIOXIN LISTING RULE SUMMARY

The final dioxin listing rule, issued January 15, 1985 (Federal Register, Vol. 50, No. 9), lists as acute hazardous wastes certain chlorinated dibenzo-p-dioxins, dibensofurans, and phenols (and their phenoxy derivatives). A complete listing is given in Exhibit A-1. When the final dioxin listing rule became effective on July 15, 1985, duplicative listings of certain dioxins under RCRA and TSCA (40 CFR 775) were revoked.

These acute hazardous wastes are subject to the 1 kg small quantity generator limitation, and residues in empty containers will be regulated. Residues from the incineration of dioxin-contaminated soils are listed as toxic RCRA wastes and are not as stringently controlled.

All persons who generate, transport, treat, store, or dispose of the wastes listed in the final rule must notify EPA or an authorized state by April 15, 1985. All hazardous waste management facilities which treat, store, or dispose of the listed wastes, and which qualify to handle the listed wastes under interim status, are required to notify by April 15, 1985 and submit a Part A permit application by July 15, 1985. Even those sites that have already qualified for interim status will not be allowed to handle the listed wastes unless they, too, qualify to handle these wastes, notify by April 15, 1985, and submit a Part A application by July 15, 1985.

Generally, the listed wastes are to be managed at fully permitted facilities (40 CFR Part 264). The following criteria must be met in order to handle the listed dioxin-containing wastes:

- Tanks and containers and enclosed waste piles - interim status facilities may handle the listed wastes.
- Land disposal facilities - landfills, waste piles, surface impoundments, and ~~and~~ land treatment facilities must comply with present Part 264 requirements and additionally provide an acceptable waste management plan for the listed wastes.

- Incinerators and thermal treatment facilities - must comply with the Part 264 requirements and additionally demonstrate 99.9999% (six 9's) destruction and removal efficiency (DRE) for the listed wastes or substances more difficult to decompose. Such facilities must be "certified" or have a RCRA permit for the listed wastes.

EXHIBIT A-1

Hazardous Waste From Non-Specific Source

EPA Hazardous Waste No.	Hazardous Waste	Hazard Code
FO 20	Wastes* from the production or manufacturing use of tri- or tetrachlorophenol, or of intermediates used to produce their derivatives.**	(H)
FO 21	Wastes* from the production or manufacturing use of pentachlorophenol (PCP), or of intermediates used to produce its derivatives.	(H)
FO 22	Wastes* from the manufacturing use of tetra-, penta-, or hexachlorobenzene under alkaline conditions.	(H)
FO 23	Wastes* from the production of materials on equipment previously used for the production or manufacturing use of tri- and tetrachlorophenols.**	(H)
FO 26	Wastes* from the production of materials on equipment previously used for the manufacturing of tetra-, penta-, or hexachlorobenzene under alkaline conditions.	(H)
FO 27	Discarded unused formulations containing tri-, tetra-, or pentachlorophenol or discarded unused formulation derived from these chlorophenols.***	(H)
FO 28	Residues resulting from the incineration or thermal treatment of soil contaminated with EPA hazardous waste FO 20, FO 21, FO 22, FO 23, FO 26, and FO 27.	(T)

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* Except wastewater and spent carbon from hydrogen chloride purification

** This listing does not include wastes from the production of hexachlorophene from highly purified, 2,4,5-trichlorophenol.

*** This listing does not include formulations containing hexachlorophene synthesized from pre-purified 2,4,5-trichlorophenol as the sole component.

(H) = Acute Hazardous Waste
(T) = Toxic Waste

ATTACHMENT B

FINAL DIOXIN LISTING RULE

__FEDERAL REGISTER__, Vol. 50, No. 9

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 261, 264, 265, 270, and 775

[SWN-FRL 2701-3]

Hazardous Waste Management System; Dioxin-Containing Wastes

AGENCY: Environmental Protection Agency.

ACTION: Final rule.

SUMMARY: The Environmental Protection Agency (EPA) is today amending the regulations for hazardous waste management under the Resource Conservation and Recovery Act (RCRA), by listing as hazardous wastes certain wastes containing particular chlorinated dioxins, -dibenzofurans, and -phenols, and by specifying management standards for these wastes. These wastes are being listed as acute hazardous wastes. Because of this action, we are removing several commercial chemical products from the list of hazardous wastes contained in 40 CFR 261.33, since these listings are duplicative. For the same reason, EPA is revoking the regulation concerning the disposal of 2,3,7,8-tetrachlorodibenzo-*p*-dioxin (TCDD)-contaminated wastes under the Toxic Substances Control Act (TSCA) when the regulation under RCRA becomes effective. The effect of this rule will be to subject these dioxin-containing wastes to the hazardous waste regulations issued under RCRA.

DATES: *Effective date:* The RCRA hazardous waste regulation becomes effective on July 15, 1985 while the TSCA rule concerning the disposal of TCDD-contaminated wastes is revoked on July 15, 1985.

Compliance dates: All persons (including those who have previously notified the Agency under Section 3010 of RCRA) who generate, transport, treat, store, or dispose of the wastes listed today are required to notify EPA or a State authorized by EPA to operate the hazardous waste program of their activities under Section 3010 no later than April 15, 1985. Notification instructions are set forth in 45 FR 12746 (February 26, 1980).[1]

All existing hazardous waste management facilities (as defined in 40 CFR 270.2) which treat, store, or dispose of wastes listed in these regulations and which qualify to manage these wastes under interim status under Section 3005(e) of RCRA must file with EPA or a State authorized by EPA to operate the hazardous waste program a notification by April 15, 1985 and a Part A permit application by July 15, 1985. Facilities which have already qualified for interim status will not be allowed to manage the wastes listed in these regulations after July 15, 1985 unless: (1) The regulation allows them to handle such wastes under interim status, (2) they file a notification with EPA or an authorized State by April 15, 1985 and (3) they submit an amended Part A permit application with EPA or an authorized State by July 15, 1985 (see 40 CFR 270.10(g)).

ADDRESSES: Public Docket: The public docket for 40 CFR Parts 261, 264, 265, and 270 is located in Room S-212A, U.S. Environmental Protection Agency, 401 M Street SW., Washington, D.C. 20460, and is available for viewing from 9:00 a.m. to 4:00 p.m., Monday through Friday, excluding holidays.

The public docket for 40 CFR Part 775 is located in Room E-107 at the same address, and is available for viewing during the same hours.

FOR FURTHER INFORMATION CONTACT: RCRA Hotline, toll-free at (800) 424-9346 or (202) 382-3000. For technical information contact: Dr. Judith S. Bellin, Office of Solid Waste (WH-562B), Environmental Protection Agency, 401 M Street SW., Washington, D.C. 20460, (202) 382-4787.

SUPPLEMENTARY INFORMATION:

I. Background
II. Summary of Regulation
III. Wastes Subject to This Regulation
  A. Wastes Containing Tetra- and Pentachloro-dibenzo-*p*-dioxins and -dibenzofurans
  B. Pentachlorophenol (PCP) Manufacturing Wastes
    1. Standards for Determining if Wastes Are Acute Hazardous Wastes
    2. Whether Wastes From the Production and Manufacturing Use of Pentachlorophenol (PCP) Should Be Classified as Acute Hazardous Waste
    3. Toxicity of PCP as a Measure of the Wastes' Toxicity
    4. Changing the Regulatory Status of Discarded PCP Formulations
    5. Alternative Basis for Establishing a 1 kg per Month Small Quantity Generator (SQG) Exclusion Limit
    6. Regulation of wastes from equipment previously used in production or manufacturing use of PCP
  C. Wastes generated on equipment previously used in the production and manufacturing use of tri- and tetrachlorophenols
    1. Scope of the Listing
    2. Practicality of the Listing
    3. Economic Burden
    4. Historical Documentation
  D. Hexachlorophene Manufacturing Waste
IV. Management Alternatives and Requirements
  A. Land Disposal and Storage of These Wastes
    1. Management of Dioxin Wastes at Interim Status Facilities
      a. Prohibitions on Management
      b. Interim status Facilities Allowed To Manage these wastes
    2. Requirement of a Waste Management Plan
    3. Prohibiting Land Disposal of These Wastes
    4. Secondary Containment at Permitted Tank and Container Storage Facilities
  B. Incineration of Dioxin-Contaminated Wastes
    1. Burning at Interim Status Incinerators
    2. Burning at Fully Permitted Incinerators
      a. Alternative DRE for Dioxin-Contaminated Wastes
      b. Requirements for Conducting a Trial Burn for These Wastes
      c. Special Notification to the Regional Administrator
      d. Periodic Compliance Tests
    3. Amendments to Parts 264 and 265
  C. Burning at Interim Status Thermal Treatment Facilities
V. Relation of this Rule to Regulation of TCDD-Contaminated Wastes Under the Toxic Substances Control Act
VI. Comments on Other Issues
  A. Development of a Toxicity Characteristic for Defining Dioxin-Contaminated Wastes as Hazardous
  B. Discarded Unused Formulations
  C. Comprehensive Environmental Response, Compensation, and Liability Act cleanup activities
  D. Other Wastes Containing CDDs and CDFs
  E. Wastes Containing Other Halogenated Dioxins and Dibenzofurans
  F. Small Quantity Generator Comments
  G. Comments on Reuse and Recycling Issue
  H. Applicability of the Mixture Rule
  I. Comments on the Analytical Method and the Background Document
VII. Relation of this Regulation to Those Promulgated Under CERCLA section 102(b) (Reportable Quantities)
VIII. State Authority
IX. Economic, Environmental, and Regulatory Impacts
  A. Regulatory Impact Analysis
  B. Regulatory Flexibility Act
  C. Paperwork Reduction Act of 1980
X. References
XI. List of Subjects

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[1] Under the Solid Waste Disposal Amendments of 1980 (Pub. L. 96-482 (October 21, 1980)), EPA was given the option of waiving the notification requirement under Section 3010 of RCRA, following revision of the Section 3001 regulations, at the discretion of the Administrator. In this instance, we believe that all persons handling or managing these wastes need to notify the Agency because of the extreme toxicity of these wastes. Therefore, *all* persons, including those individuals who have previously notified EPA that they generate or handle other hazardous wastes, must notify EPA that they are generating or handling these dioxin-containing wastes.

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I. Background

On April 4, 1983, EPA proposed to amend the regulations for hazardous waste management under RCRA by listing as acute hazardous wastes[2] certain wastes containing particular chlorinated dioxins, -dibenzofurans, and -phenols, and by specifying certain management standards for these wastes (see 48 FR 14514–14529). Some of these materials already are hazardous wastes under 40 CFR 261.33(f), a provision which lists discarded commercial grade, technical grade, off-specification products, and discarded formulations when the toxicant is present as the sole active ingredient. Since we proposed to list these wastes as acute hazardous wastes, we also proposed to delete several commercial chemical products (i.e., EPA Hazardous Waste Nos. U212, U230, U231, U232, U233, and U242) from the list of hazardous wastes contained in 40 CFR 261.33(f) in order to avoid listing the same waste under two different (and inconsistent) provisions. Finally, EPA proposed to revoke its regulation concerning the disposal of 2,3,7,8–TCDD contaminated wastes under TSCA when the RCRA regulation becomes effective.

EPA requested comments on all aspects of the proposed regulation. The agency has evaluated these comments and has accordingly modified the regulations as well as the supporting documentation. This notice finalizes the regulation proposed on April 4, 1983, and outlines EPA's response to many of the comments received on that proposal. (The Agency's response to the other comments are set forth in the revised Background Document for this listing.) The Agency also notes that the proposed regulation was validated by Congress in the Hazardous and Solid Waste Amendments of 1984 (HSWA). In particular, the bill requires EPA to finalize the "dioxin-containing hazardous waste numbered FO20, FO21, FO22, and FO23 (as referred to in the proposed rule published by the Administrator in the **Federal Register** on April 4, 1983)" within six months of the bills enactment (Section 222(a)). In addition, Section 201(e) of the law requires EPA to consider prohibiting the land disposal of the proposed listings. (The prohibition on land disposal is rebuttable under certain circumstances.)

II. Summary of the Regulation[3]

This regulation designates as RCRA acute hazardous wastes process wastes from the manufacturing use of tetra-, penta-, or hexachlorobenzenes under alkaline conditions; wastes from the production and manufacturing use of tri-, tetra-, and pentachloro-phenols and their chlorophenoxy derivatives;[4] and discarded unused formulations containing tri-, tetra-, and pentachlorophenols or formulations containing compounds derived from these chlorophenols. Also listed are wastes that are generated in the course of a manufacturing process performed on equipment previously used for such operations, except where the equipment was used only for the manufacture or formulation of pentachlorphenol (PCP) or its derivatives. The wastes covered by this rule include reactor residues, still bottoms, brines, spent filter aids, spent carbon from product purification, and sludges from wastewater treatment, but do not include untreated wastewater or spent carbon from hydrogen chloride purification.

As a consequence, these wastes will all be subject to the 1 kg per month small quantity generator exclusion limit. See 40 CFR 261.5(e) and 261.30(d). Residues in containers that contain these listed wastes are also regulated under subtitle C of RCRA, unless the container has been triple-rinsed using a solvent capable of removing the waste, or the container has been otherwise cleaned by a method that thas been shown to achieve equivalent removal. See § 261.7(b)(3)[5] In addition, soils contaminated with these wastes are also regulated since soils contaminated by hazardous wastes spills are defined as being in the RCRA system.

These wastes also will be subject to special standards when land disposed, incinerated, or stored. Since these wastes will now be subject to regulation under RCRA, we are also revoking the TSCA dioxin rule.

III. Wastes Subject to This Regulation

EPA proposed to list as acute hazardous wastes process wastes from the manufacture of tetra-, penta-, or hexachlorobenzenes under alkaline conditions; wastes from the production and manufacturing use of tri-, tetra-, or pentachlorophenols and their chlorophenoxy derivatives; and discarded unused formulations containing tri-, tetra-, and pentachlorophenols or formulations containing compounds derived from these chlorophenols. We also proposed to list wastes resulting from the production of materials on equipment previously used for such operations. This section of the preamble discusses the comments received on the listing of these wastes as acute hazardous wastes, as well as our response.

A. Wastes Containing Tetra- and Pentachloro-dibenzo-p-dioxins and -dibenzofurans

In listing these wastes as acute hazardous wastes, EPA relied principally upon the presence, in significant concentrations, of CDDs and CDFs in the wastes, and to a lesser extent on the presence of certain chlorophenols and chlorobenzenes. The CDDs and CDFs are, for certain animal species, the most potent man-made toxicants known. These wastes also have been associated with some of the most serious hazardous waste damage incidents known, including those at Love Canal (NY), and at Times Beach (MO).

The levels of TCDD in these wastes are of concern in terms of the potential for serious harm to human health if they are released to water or air, either in soluble form or adsorbed to soil particulates. Based on its carcinogenic potential, the Water Quality Criterion for 2,3,7,8-TCDD is 10^{-6}-10^{-7} ppb (U.S. EPA, 1978b). This value is a very small fraction (about 10^{-12}) of the concentration of TCDDs in the listed wastes.

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[2] The RCRA definition of acute hazardous waste is set forth at 40 CFR 261.11(a)(2). Under that definition, a material is not necessarily "acutely toxic" in the way that term is used by toxicologists. Rather, the term is intended by EPA to identify wastes that are so hazardous that they may, either through acute or chronic exposure "cause, or significantly contribute to an increase in serious irreversible, or incapacitating reversible illness" regardless of how they are managed. Wastes with particularly low LD50 or LC50 toxicities, or wastes containing substantial concentrations of potent carcinogens, are the most likely candidates for listing as acute hazardous wastes (see 45 *FR* 33106–33107, May 19, 1980).

[3] The following acronyms and definitions are used in this document (and in the Background Document for this regulation):

PCDDs = all isomers of all chlorinated dibenzo-*p*-dioxins.

PCDFs = all isomers of all chlorinated dibenzofurans.

CDDs and CDFs = all isomers of the tetra-, penta- and hexachloloro-dibenzo-*p*-dioxins and -dibenzofurans, respectively.

TCDDs and TCDFs = all isomers of the tetrachlorodibenzo-*p*-dioxins and -dibenzofurans, respectively.

TCDD and TCDF = the respective 2,3,7,8,-isomers.

The prefixes D, Tr, T, Pe, and Hx denote the di-, tri-, tetra-, penta-, and hexachlorodioxin and -dibenzofuran congeners, respectively.

[4] The proposed regulation specified these derivatives as the chlorophenoxy acids, esters, and amine salts, but omitted reference to other derivatives and other (e.g., alkaline) salts. This inadvertent omission is rectified in the final regulation.

[5] If the container is cleaned, the container would be considered empty and no longer subject to regulation. However, the rinsate that is generated would be an acute hazardous waste, and, thus, subject to regulation. See 45 *FR* at 78528 (November 25, 1980).

Commenters did not seriously challenge that production wastes containing TCDDs and TCDFs were properly listed. We therefore are adopting these listings as final today. Challenges to EPA's decision to list wastes generated on equipment previously used to produce wastes containing TCDDs and TCDFs are discussed in Section C. of this section of the preamble.

Several respondents, however, did comment on EPA's use of structure/activity relationships in its decision to list all CDDs and CDFs as toxicants of concern, stating that it is not scientifically valid to consider all the CDDs and CDFs as having the same toxicologic properties, and that there are species-specific exceptions to the correlations cited between biochemical endpoints and toxicity. Several commenters also suggested that EPA's reliance on the case of *EDF* v. *EPA* (598 F.2d 62 (D.C. Cir., 1978)), cited in partial support for EPA's determination, is incorrect. The commenters stated that the court's determination in the case of *EDF* v. *EPA* (which involved polychlorinated biphenyls) (PCBs), allowed EPA to infer toxicity based on structure-activity relationships because the congeneric composition of the PCB mixture was not known, and because the toxic characteristic of all the congeners was not known.

EPA agrees with the commenters that there is considerable variation in the acute and chronic toxicity, as well as in the biochemical activity of the various CDD and CDF congeners and isomers. We alluded to these differences in the preamble to the proposal. See 48 *FR* 14515, April 4, 1983. In addition, these differences were noted both in the background document and in the health and environmental effects profiles. However, we continue to judge that, because most of the isomers of the listed CDDs and CDFs are very toxic, albeit to different degrees, and because the Agency believes that most of these wastes contain a certain percentage of the most toxic (TCDD) component, it is appropriate and permissible to rely, in part, on the known structure/activity relationships to establish the potential toxicity of these wastes.[6]

It should also be noted that the Agency is not evaluating the toxicity of the HxCDD and HxCDF congeners—the chlorinated dioxins and -dibenzofurans most prevalent in wastes from PCP production and manufacturing use—solely by reference to structural similarity with TCDD and TCDF. Rather, we have made an independent assessment of the toxicity of the HxCDDs, and believe that they are also very potent carcinogens, albeit less potent than TCDD. We are, however, relying on structure/activity relationships in stating that all forms of HxCDDs and HxCDFs are constitutents of concern.

B. Pentachlorophenol (PCP) Manufacturing Wastes

1. *Standards for Determining if Wastes Are Acute Hazardous Wastes*

Before challenging the Agency's substantive determinations, some commenters argued that EPA does not have the authority to regulate the designated wastes as acute hazardous wastes under 40 CFR 261.31. In particular, these commenters argue that the criteria cited in the regulation for listing acute hazardous waste (see 40 CFR 261.11(a)(2)) allows EPA to classify as acute hazardous wastes only those wastes which meet *all* of the criteria set forth, and that the criterion that such a waste be "capable of causing or significantly contributing to an increase in serious irreversible, or incapacitating reversible illness" is impermissibly vague.

We believe that the commenters have misinterpreted the cited regulation. The regulation (40 CFR 261.11(a)(2)) clearly states that a waste is considered to be an acute hazardous waste if its acute toxicity meets the criteria for acute lethality as defined in 40 CFR 261.11(a)(2), *or* if it can cause or contribute to serious irreversible illness. The regulations do not state that an acute hazardous waste must meet *all* of the listed criteria; the conjunction "or" is employed. As to the lack of definitiveness of the qualitative criterion, the regulation quotes the statutory standard verbatim. No one has challenged the statutory provision (Section 1004(5)(A)) as impermissibly vague, nor did we receive any comments on this criteria during the comment period following the promulgation of § 261.11(a)(2) on May 19, 1980. Furthermore, in the preamble to that regulation, EPA stated its intent to apply this standard to wastes "containing substantial concentrations of potent carcinogens. . . ." (See 45 *FR* 33107). TCDD and several HxCDDs are among the most potent carcinogens tested in rodents, and are present in these wastes in substantial concentrations. We therefore believe that neither the statute nor the regulations are impermissibly vague, and that we have fully articulated the reasons for our conclusion that these wastes meet the criterion for listing as acute hazardous wastes.

2. Whether Wastes From the Production and Manufacturing Use of Pentachlorophenol (PCP) Should Be Classified as Acute Hazardous Wastes

EPA proposed to list wastes from the production and manufacturing use of PCP, discarded unused formulations containing PCP, and wastes from equipment previously used for the production or manufacturing use of PCP as acute hazardous waste. Generators of these wastes questioned whether the wastes should be classified as acute hazardous wastes. They argued that these wastes do not contain the most toxic dioxin or dibenzofuran congener (2,3,7,8-TCDD or TCDF), and went on to argue that the dioxin congeners they do contain—HxCDDs—are not carcinogenic or otherwise toxic enough to justify the acute hazardous waste classification. They also maintained that there are no other reasons to justify listing these wastes as acute hazardous wastes.

As already explained, wastes are listed as acute hazardous waste under the criteria for listing contained in 40 CFR § 261.11(a)(2). The principal basis for listing the PCP wastes as acute hazardous wastes is the presence of substantial concentrations of HxCDDs and HxCDFs, and of PCP, which has potential chronic systemic effects.[7] [8] While TCDDs are very rarely found in PCP or in wastes resulting from the production or manufacturing use of PCP (Buser and Bosshardt (1976) reported 0.50–0.25 ppm of an unidentified "TCDD" isomer), HxCDD concentrations range from 1–39 ppm (USEPA, 1982a; Miles et al., 1984). In addition, an isomer-specific analysis determined that the carcinogenic 1,2,3,6,7,8-HxCDD constitutes about 20–60% of the HxCDDs present (USEPA, 1978; Miles et al., 1984). Moreover, PCP contains about 0.12 ppm each of TCDFs and PeCDFs, and from 9–99 ppm of

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[6] We also believe that the identification of individual isomers in the waste (*i.e.*, analyze the waste for the specific dioxin and dibenzofuran isomers) would be quite costly and unnecessary because of the toxic nature of the dioxin and dibenzofuran isomers.

[7] Fetotoxic and teratogenic effects (statistically significant skeletal and soft tissue anomalies, fetal growth retardation, and increased embryonic resorptions) have been reported in rats exposed to commercial and purified PCP (USEPA, 1981a).

[8] These wastes also contain hexachlorobenzene (HCB), a compound identified by the Agency's Carcinogen Assessment Group as a potential human carcinogen. Because the Agency has no data on the concentration of HCB in these manufacturing wastes, HCB is not at this time cited as a constituent of concern (Appendix VII constituent). If data warrant, these listings may accordingly be amended.

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HxCDFs (USEPA, 1978). As discussed below (Section III. B. 3.), these levels are of regulatory concern.

Several commenters disputed EPA's determination that the two HxCDDs are carcinogenic. They submitted an expert's review of the bioassay conducted by the National Cancer Institute (NCI) of a mixture of two HxCDDs (Squire, 1983).[9] The expert reviewer reported a lower incidence of neoplastic nodules in female rats than that reported by NCI (and originally accepted by EPA). He evaluated several of the lesions diagnosed as tumors by NCI as non-neoplastic regenerative nodules, but concluded that there is "equivocal" evidence that these HxCDDs are potential human carcinogens.

As a result of these comments, scientists from EPA's Carcinogen Assessment Group (CAG) and the National Toxicology Program (NTP) have reviewed both the reviewing expert's comments and the underlying data (histology slides) gathered in the original NCI study. Their re-evaluation confirms the original conclusion that there is sufficient evidence that the mixture of HxCDDs studied by NCI is carcinogenic as indicated by a statistically significant increased incidence of liver tumors in female rats and in mice of both sexes (Haberman and Bayard, 1984; Hildebrandt, 1983, McGaughy, 1984). This review led EPA to estimate that the carcinogenic potency of the two HxCDD isomers ranged from 0.59 (male rat) to 11 (male mouse) per µg/kg/day. The CAG recommended that 6.2 per µg/kg/day, derived from hepatocellular carcinoma and adenoma data in the male mice and female rats (the test systems in which the response was most strongly evident) be used as the best estimate of the upper limit potency estimate for HxCDD (McGaughy, 1984).

Even the lowest of these estimates, however, makes HxCDD one of the most potent carcinogens identified by the Agency. For example, this mixture of HxCDDs, although about 1/25 as potent as TCDD, is as potent a carcinogen as Aflatoxin B_1 (a well recognized potent carcinogen), and is about a thousand times more potent than ethylene dibromide (EDB).

Commenters also submitted an epidemiologic study of the effects of several chemical preservatives, including PCP, on the health of woodworkers, as evidence that no deleterious health effects can be ascribed to these chemicals (AWPI, 1983).[10] EPA reviewed this study, and notes that it has severe limitations (Erdreich, 1983; Ris, 1983). First, a cross-sectional study design is not a suitable method for detecting a cancer effect, because in such a study persons with cancer who are currently employed are not likely to be identified as having the disease. In addition, other deficiencies were pointed out, *viz.*, small sample size; insufficient follow-up period following the onset of exposure; and lack of exposure definition. EPA, therefore, concludes that the submitted epidemiological study is not adequate for assessing the presence or absence of a cancer risk or other health effects in wood treaters exposed to PCP (Erdreich, 1983; Ris, 1983). In addition, reports have been accumulating in the open literature which indicate that workers in occupations associated with PCP exposure are at increased risk of nasal and nasopharyngeal cancer, stomach cancer, and non-Hodgkins lymphoma (Grufferman et al., 1976; Bishop and Jones, 1981; Hardell et al., 1982; Gallagher and Threlfall, 1984). Since these are reports of studies of occupational exposure, it is of course unclear whether the etiologic agent is PCP or its associated CDD or CDF impurities. However, these reports reinforce EPA's decision regarding the capability of these wastes to cause or contribute to serious irreversible, or incapacitating reversible, illness.

Several commenters also suggested that the toxicity of HxCDDs at the levels found in PCP are not of regulatory concern. The commenters argue that, because the amount of HxCDDs which, they estimate, is contained in the median rat lethal dose of PCP is less than the teratogenic lowest observed effect level (LOEL) noted for HxCDDs, EPA should be more concerned with the acute toxicity of PCP than with the chronic toxic effects of its HxCDD contaminants. They further state that no increased risk of oncogenicity will result from HxCDD exposure resulting from exposure to PCP at its NOEL for reproductive effects.

EPA disagrees with these statements. When we consider cancer, daily exposure even at one hundredth of the LD_{50} of PCP containing 15 ppm of HxCDDs would result in exposure to 18 ng HxCDD/kg/day.[11] Lifetime exposure at this level could entail a potential excess cancer risk as high as one in a hundred. With respect to reproductive toxicity, the Allowable Daily Intake (ADI) is estimated as one hundredth (NAS, 1977) of the reproductive NOEL or 1 ng HxCDD/kg/day. Someone exposed to a dose approaching the median LD_{50} established in the rat (120 mg PCP/kg/day) therefore would receive a dose 1800[12] times larger than the ADI anticipated for the reproductive effects of HxCDD. Therefore, the reproductive effects of HxCDD potentially occur at doses three orders of magnitude lower than those at which the lethal effects of PCP are expected.

Additionally, the levels of HxCDDs in PCP wastes are of concern in terms of the potential for serious harm if they are released to water or air, either in soluble form, or absorbed to soil particulates. Based on its carcinogenic potential, the Water Quality Criterion for 2,3,7,8-TCDD has been set as $10^{-8}-10^{-7}$ µg/l (USEPA, 1984b). Since a mixture of two HxCDDs is about 4% as potent a carcinogen as TCDD (McGaughy, 1984), and because the water solubility, soil sorption characteristics, and bioaccumulation potential of HxCDDs and TCDD are very similar (see Background Document for this listing), an appropriate estimate for a similar criterion for HxCDDs is about 25 times as large as that for TCDD, *viz.*, $10^{-7}-10^{-6}$ µg/l. This value is a minuscule fraction (10^{-10}) of the concentration of HxCDDs in the PCP wastes.

We therefore conclude that the potential toxicity of HxCDDs at the levels found in PCP are of regulatory concern and that these wastes contain significant concentrations of potent carcinogens. These wastes therefore meet the criteria of 40 CFR 261.11(a)(2), justifying the listing of these wastes as acute hazardous wastes.

3. Toxicity of PCP as a Measure of the Wastes' Toxicity

One commenter noted that PCP, which is contaminated with carcinogenic HxCDDs, was not carcinogenic in several bioassays, and therefore questioned the Agency's conclusion that the two HxCDDs are potential human carcinogens.

We do not believe that the PCP bioassays are adequate to support a conclusion concerning the potential carcinogencity of PCP and HxCDD-containing wastes. The carcinogenic risk of PCP containing ppm concentrations of HxCDD is not expected to give positive results at the dosages used in these bioassays. At the lowest dose used in the HxCDD oral bioassay (1.25 ug HxCDD/kg/day), tumor rates of 0 and 20% were noted in groups of 50 female and male Osborne Mendel rats (USDHHS, 1980). For a dose of 0.3 ug HxCDD/kg/day (the amount of HxCDD contained in the *highest* PCP dose used in the PCP study) a 0–5% response rate would be expected in the same rat strain. This rate is far too low for reliable detection. Moreover, the two best PCP bioassays (USDHHS, 1980 and Schwetz, 1978) were conducted in rats of different strains, that may differ in response. A review of these and other PCP bioassays also noted procedural deficiencies, such as an inadequate observation period, the use of only one animal species per test, and inadequate numbers of animals (Williams, 1982). Therefore, we believe that these studies do not permit a conclusion as to the potential carcinogenicity of PCP. In addition, as outlined above, there are several reports showing increased cancer risk (of unknown etiology) in occupations associated with PCP exposure. Moreover, the fact that HxCDDs are potential human carcinogens of very high potency renders them of great regulatory concern.

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[9] This review was submitted well after the close of the comment period, but the Agency chose to consider it as part of the rulemaking record.

[10] This review also was submitted well after the close of the public comment period, but the Agency again chose to consider it as part of the rulemaking record.

[11] $1/100 \times LD50 \times 15$ ppm HxCDD/PCP × 1/body weight $= 10^{-2} \times 120$ mg PCP/kg/day × (15×10^{-6} mg HxCDD/mg/PCP) × 10^{6} ng/mg = 18 ng HxCDD/kg/d = 0.018 µg HxCDD/kg/day.

[12] Exposure/ADI = (15×10^{-6} mg HxCDD/mg PCP × 120 mg PCP/kg/d × 10^{6} ng/mg) / 1 ng HxCDD/kg/day = 1800.

We therefore conclude that, because these wastes contain the potent carcinogen HxCDD at levels of regulatory concern, they meet the criteria of 40 CFR 261.11(a)(2), and are properly listed as acute hazardous wastes.

4. Changing the Regulatory Status of Discarded PCP Formulations

Several respondents commented that EPA does not have the authority to regulate tetra- and pentachlorophenol containing wastes as acute hazardous wastes. These persons called attention to prior RCRA rulemaking involving these compounds.

More specifically, in the hazardous waste regulations published on May 19, 1980, PCP was listed as an acute hazardous waste (§ 261.33(e)) because the Agency was under the mistaken impression that its oral LD50 in the rat was less than 50 mg/kg. When this error was pointed out, the Agency's determination was rectified, and PCP was listed as a hazardous waste under § 261.33(f) (see 45 *FR* 78533, November 25, 1980). However, EPA's evaluation considered only the acute oral toxicity of PCP, and did not consider its known contamination with CDDS and CDFs. It would not be in the best interests of the public if EPA allowed a previous determination to go unaltered when additional data show that prior rulemaking was in error. Thus, the regulatory classification of PCP was initially rectified when data seemed to warrant it. In the current regulation, that status is once more changed, because reconsideration of additional data warrant such action.

5. Alternative Basis for Establishing a 1 kg per Month Small Quantity Generator (SQG) Exclusion Limit

In response to the arguments that these wastes are not acute hazardous wastes, we note that we also have an alternative (and independent) justification for a small quantity generator limitation of 1 kg per month for these (PCP) wastes. Under § 261.11(c) of these regulations, EPA may consider the criteria for listing contained in § 261.11 (a)(2) and (a)(3) of the regulations to establish small quantity generator limitations for particular wastes that are lower than 1000 kg per month. EPA will do this where "the general exclusion limits of 1000 kg per month is insufficient to protect human health or the environment." (See Background Document to Section 261.11, May 19, 1980, at p. 60.) That situation is the case for these wastes. As explained in the preamble and the Background Document for the proposed rule, and restated here, these wastes contain significant concentrations of potent carcinogens, and high concentrations of other compounds (HxCDFs and PCP) that are also very toxic. These contaminants have proven to be mobile and persistent in the environment. There also have been many damage incidents involving PCP formulation wastes (see Background Document for this listing). For all these reasons, we believe that these wastes could (and have) cause(d) substantial harm to human health and the environment when managed at unregulated facilities, and that a 1000 kg per month SQG limit is inappropriate for these wastes. In order to ensure that these wastes will be managed at Subtitle C facilities, the appropriate exclusion limit established in the 40 CFR Part 261 regulations is 1 kg per month. This same reasoning applies, with equal force, to the other wastes covered by this listing. The legislative history of the newly enacted HSWA also states unequivocally that these wastes (*i.e.*, all of the wastes covered by the April 4 proposal) are not to be excluded from regulation by virtue of the small quantity generator exemption. See S. Rep. No. 98–284, 98th Cong. 2nd Sess. at 34.

We are making a conforming change to § 261.30(d) of the regulations to indicate that these wastes are subject to the 1 kg. per month small quantity generator limitation. (It should be noted, however, that we read § 261.30(d) as a provision for designating toxic as well as acute hazardous wastes as subject to the lower small quantity generator limits).

6. Regulation of Wastes from Equipment Previously Used in the Production or Manufacturing Use of PCP

Based on the arguments presented above, the commenters also believe that wastes from equipment previously used in the production or manufacture use of PCP should not be regulated as acute hazardous waste. Although we generally disagreed with the specific points of toxicology made by the commenters, we nevertheless have decided not to finalize this provision at this time. In reviewing our data base, we determined that, unlike wastes that are generated on equipment previously used in the production or manufacture use of tri- and tetrachlorophenols or their derivates, we have insufficient information on the concentration of HxCDDs and HxDCFs in wastes generated on equipment previously used in the production or manufacture use of PCP to determine whether these wastes contain HxCDDs and HxCDFs in sufficient concentrations to be regulated generically as acute hazardous or hazardous waste. As a result, EPA expects to further investigate the wastes that are generated on previously contaminated equipment; based on those findings, we will take appropriate regulatory action. In the meantime, these wastes may still be hazardous waste if they either exhibit one or more of the characteristics of hazardous waste, or if the waste is already listed (or contains a waste listed) in Subpart D of Part 261.

C. Wastes Generated on Equipment Previously Used in the Production and Manufacturing Use of Tri- and Tetrachlorophenols

Several respondents commented on EPA's proposal to regulate, as acute hazardous wastes, wastes resulting from manufacturing processes conducted on equipment previously used to produce tri- and tetrachlorophenols (proposed EPA Hazardous Waste No. F022). These wastes were listed based on sampling and analysis data which show that wastes generated on equipment previously used in the production and manufacturing use of tri- and tetrachlorophenols are contaminated with CDDs even after production shifts to other products; in many cases, these toxicants have been found to remain in the wastes years after production shifted. In addition, there is a history of environmental contamination resulting from these contaminated equipment wastes at such places as Verona, Missouri, to justify these regulations. Furthermore, there is precedent for listing these wastes in that some of them are currently regulated under 40 CFR Part 775, a regulation issued under Section 6 of the Toxic Substances Control Act (TSCA), based on a finding that unregulated disposal presents an unreasonable risk of injury to health or the environment.

Nevertheless, a number of commenters questioned the scope and practicality of the regulations and suggested several changes.

1. Scope of the Listing

(a) Several commenters felt that the proposed definition of EPA Hazardous Waste No. FO22 was broader than intended by EPA. In particular, they indicated that EPA Hazardous Waste No. FO21 refers only to the *manufacturing use* of certain chlorobenzenes under alkaline conditions, but does not cover the actual production of the compounds themselves. These commenters argue that the proposed listing of FO22 refers to wastes from the production of materials on equipment previously used for the *production or manufacturing use* of materials listed under FO20 and FO21. Thus, the commenters believe that there is an unintended inconsistency in the rules as proposed.

In reviewing these comments, we agree that the proposal erroneously read to include wastes generated on equipment once used to produce chlorobenzenes. Therefore, we have modified the listing to make it clear that the listing only applies to wastes from equipment used previously in the *manufacturing use* of designated chlorobenzenes (under alkaline conditions) [See new hazardous waste listing FO28.]

(b) One commenter argued that the effect of the contaminated equipment listing is extremely broad, and indicates that, while it is not explicitly stated, storage, treatment, and disposal facilities that have ever managed these chlorophenols and chlorobenzenes will be deemed to be part of the "equipment" used to manufacture these products, and thus, be covered under this listing. Consequently, they argue that all waste management facilities in this category would be shut down until full permit status is achieved.

We disagree with the point made by the commenter. As currently drafted, and as discussed in the supporting documentation, this listing applies and is only meant to apply to equipment used in the *actual* production or manufacturing use of the appropriate products (*i.e.*, reactor vessels, distillation columns, filtration equipment, etc.), and does not apply to equipment used by waste management facilities (*i.e.*, treatment, storage, and disposal facilities). The existing TSCA rule (40 CFR 775.183(g)) is likewise so limited. The commenter raises a valid point, however, that needs to be investigated to determine whether the listing should be expanded. EPA will, therefore, investigate the extent of dioxin contamination in wastes (*e.g.*, incineration residues) generated from waste management facilities that previously managed these dioxin wastes. However, until these investigations are completed and a decision is made, this listing will only apply to wastes generated on equipment used as part of the actual production process.

It has also been argued that like the wastes that are generated from manufacturing operations—namely, the production and manufacturing use of tri- and tetrachlorophenols—that have become contaminated from past production or use, the equipment on which these wastes were generated (*i.e.*, reactor vessels, product storage tanks, etc.) when they are taken from service and scrapped (rather than cleaned) should likewise be regulated under RCRA. In fact, extensive TCDD contamination at a scrap metal salvage facility in Newark (NJ) has been traced to the presence of scrapped reaction vessels which, it is thought, were once used for the production of 2,4,5-T. Scrap metal wipe samples, taken many years after the equipment has been scrapped, showed extensive contamination: 250 ng TCDD/m^2 at the surface of a large reaction vessel in the center of a waste pile. Soil adjacent to cut tanks contained about 3 ppm of TCDD, and low ppb concentrations were detected in surrounding properties (USEPA, 1984). Although situations such as these are of great concern to the Agency, we have decided not to list this equipment, even if discarded, as hazardous (or acute harzardous) waste at this time. EPA has very limited information to define, on a generic basis, *all* equipment which at one time was used to produce tri- or tetrachlorophenols as hazardous (or acute hazardous) waste under RCRA. However, as is the case for residues which are generated from waste management facilities, EPA plans to study the extent of environmental contamination from this equipment if it were discarded prior to decontamination. Once these investigations are completed, we will take the appropriate regulatory action.

(c) One commenter argued that the regulation regarding contaminated equipment waste should be limited to equipment used during the actual synthetic process and the subsequent purification procedures, since these wastes would tend to have the highest concentrations of CDDs and CDFs. The commenter also suggested that EPA should specifically exclude equipment used for subsequent handling of products in ways which are not expected to generate additional CCDs or CDFs.

We cannot agree that the listing should be limited in this way. While it is true that wastes generated on equipment used in synthesis or purification are expected to contain CDDs and CDFs in concentrations several orders of magnitude higher than in waste generated on equipment used only for formulation, (*i.e.*, several hundred ppm *vs.* several ppm), the latter levels are still of regulatory concern. Accordingly, EPA has decided that all wastes that are generated on equipment which has become contaminated from previous manufacturing operations must be managed as acute hazardous wastes, unless a delisting petition establishes that a particular waste is not of regulatory concern or should not be considered an acute hazardous waste.

2. Practicality of the Listing

Several commenters questioned the reasonableness of listing as hazardous, wastes that are generated on equipment that may, at any time in the past, have been used in processes generating CDDs or CDFs. They argued that such a listing is not necessary since current cleaning practices (*i.e.*, triple rinsing or other equivalent cleaning methods) will ensure that any wastes generated from such equipment will not be contaminated. They, therefore, suggest that a person be allowed to make such a demonstration. They believe that such a showing could be accomplished by demonstrating that the equipment has been adequately cleaned (*e.g.*, by vapor phase degreasing, solvent washing, etc.), or by testing the waste to determine if it contains significant concentrations of CDDs/CDFs. (The commenters, however, did not indicate how such a demonstration of adequate cleaning would be made, short of testing the waste.) One commenter felt, in any

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event, that after some time period during which the equipment has been in another use, the equipment should automatically be considered to no longer be contaminated with CDDs/CDFs. In particular, they suggested a reasonable time period would be three years, as it is common for industry to retain records for this time period.

EPA agrees that persons should be allowed to demonstrate that their waste is no longer contaminated with CDDs/CDFs. However, we believe the only way to make this showing is by testing the waste and submitting an exclusion petition (commonly referred to as "delisting") under 40 CFR 260.20 and 260.22. These procedures have been in use for several years, and we see no reason to set up a special set of procedures. There is no difference between a petition making such a demonstration for these wastes, and petitions to exclude any other waste from the hazardous waste regulations, or petitions to change the regulatory status of a waste from acute hazardous to hazardous.

We do not believe, however, that a showing of equipment cleanliness could easily be made by evaluating the concentration of CDDs and CDFs in equipment rinsate. Such a showing would be very difficult, if not impossible, to make without knowing a great deal of detail for each equipment train, such as its size and complexity, and the amount of rinsate that was used. Even knowing this information, however, may not suffice, because of the many factors that need to be considered to set a standard for CDD/CDF "cleanliness". For example, large equipment trains are difficult to rinse, and the concentration of CDDs and CDFs in the rinsate would depend in part on the amount of solvent used; compliance would therefore be difficult to determine.

In an effort to get additional information on this option, however, we requested the commenter (and several other industrial entities) to provide the Agency with data showing in what manner, and to what extent adequate decontamination of manufacturing equipment might be achieved and demonstrated. We did not obtain a response. Additionally, experience indicates that decontamination is, in fact, very difficult, even if strenuous attempts are made (see, for instance, Bleiberg, 1984; Goldmann, 1973; Dalderup, 1978; Fishbein, 1982; Sambeth, 1983).

We likewise do not believe that enough information is available to set a time period after which wastes that are generated on previously contaminated equipment should be deemed non-contaminated. Quite the opposite: recent sampling and analysis at a facility which used 2,4,5,-TCP almost eight years ago showed ppb concentrations of TCDD in still bottoms from 2,4-DCP manufacture (where the presence of 2,3,7,8,-TCDD in such concentrations is not expected, absent contamination from an outside source). We also requested further information from those commenters who made this last point (*i.e.*, set a time period after which the waste is no longer considered to be contaminated with CDD's/CDF's); however, no response was returned, indicating a lack of information to justify setting any time period at this time.

3. Economic Burden

Several commenters argued that this listing will result in economic hardship by requiring premature discarding of "contaminated" equipment, especially to those who prudently cleaned and are reusing the equipment. They believe that such a requirement bears no relationship to whether or not any contaminants may be present and would preclude the use of some very sophisticated and expensive equipment to establish the absence of hazards in wastes that they claim would present no risk.

We disagree with these comments. As discussed above, generators who have cleaned their equipment can show by analysis of their wastes, and a delisting petition, that their wastes do not contain the toxicants of concern at levels that are of regulatory concern. Generators also can dispose of the wastes generated on this equipment as acute hazardous wastes, rather than discarding the equipment (*i.e.*, nowhere in this regulation does the Agency require (or even suggest) that existing production equipment must be scrapped and discarded). In any case, a regulatory impact analysis conducted for this regulation (see Section IX. A. below) has convinced us that its economic burden will be modest. The details of this analysis are discussed in Section IX. of this preamble.

4. Historical Documentation

As part of the proposal, the Agency also solicited comments on the appropriate recordkeeping time periods and types of historical records that should be considered adequate for a showing that equipment was not used for processes generating CDDs/CDFs. Several commenters suggested that three to four years should be set as the typical document retention period. Otherwise, they argue, the approach will not have much utility, since most corporations will not have the records necessary to make the requisite showing. Regarding the types of records that should be considered adequate, they suggest that production process and product records would supply the necessary information.

In requesting comments in this area, EPA was concerned as to how a generator could legitimately know whether the equipment in question was previously used in these processes. If records are kept for only three to four years, as claimed by the commenters, a generator could question how this regulation could be enforced, *i.e.*, will every generator be required to test their waste to determine whether it is contaminated with CDDs/CDFs if records are not available?

Upon re-evaluation of this point, we now believe this to be much less of a problem than originally thought. More specifically, as part of its preliminary investigations conducted as part of the dioxin strategy, EPA has identified most, if not all, of the manufacturers and formulators of tri- and tetrachlorophenols and their derivatives from the list of registrants who have notified the Agency, under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). In addition, the Agency, through its Regional Offices, has contacted many of these companies to verify the Agency's information.

Therefore, we believe that those companies who once made these products, and who still use the equipment, will most likely know that this regulation applies to them. The same is true for those who bought equipment from companies that produced or formulated tri- or tetrachlorophenols (or their derivatives), and who knew what type of equipment they bought (*i.e.*, these buyers know that this equipment is contaminated with CDDs and CDFs, and that the resultant wastes are regulated under RCRA). Therefore, the only group of persons who may not know that the wastes they are generating are regulated under these dioxin rules are those who unknowingly bought equipment used to produce or formulate tri-or tetrachlorophenols or their derivatives. This group of individuals may have difficulty in knowing that they are subject to the regulations. However, as indicated above, the Agency has been able to identify most, if not all, companies that produce or formulate these products.

Therefore, any person who suspects that he may have equipment that is contaminated with CDDs or CDFs should contact EPA for further information. In any event, this list will be useful for any person wishing verification that they are generating dioxin-contaminated wastes. It should also be noted that some of these persons should already be aware of this contamination, since they have been subject to the TSCA rule since May 1980.

D. Hexachlorophene Manufacturing Wastes

One commenter believes that EPA had approximately excluded wastes from the production on Hexachlorophene (HCP) synthesized from highly purified 2,4,5-TCP from the proposed FO20 listing,[13] but added that, because CDDs and CDFs are not generated in that process, HCP production and formulation wastes should similarly be exempted from the proposed FO22 and FO23 hazardous waste listings.

EPA agrees with the commenter that a similar exception is warranted in cases where such HCP is the only ingredient in the discarded formulation. The regulatory language has been changed to reflect this point. It should also be noted, however, that HCP is itself toxic. Therefore, we anticipate listing HCP manufacturing wastes and discarded formulations which contain HCP as hazardous wastes at some future date.

IV. Management Alternatives and Requirements

A. Land Disposal and Storage of These Wastes

The Agency proposed a degree of hazard approach for these wastes. In light of their inherent danger and previous poor management history, EPA proposed that these wastes be prohibited from being managed at most types of interim status facilities, and that land disposal be conducted pursuant to additional special standards implemented during the course of the permit proceeding. We also requested comment as to whether incinerators, and tank and container storage facilities should be subject to additional management standards when they manage these wastes. This section of the preamble describes the comments to these proposals, and the Agency's response and changes in approach made in response to comments.

We also note that all of these wastes are specifically identified as candidates for being banned from land disposal in two years under the HSWA (See RCRA amended Section 3004(e)). Thus, the following discussion describes an interim regulatory regime, insofar as it pertains to land disposal of these wastes.

1. Management of the Dioxin Wastes at Interim Status Facilities

a. *Prohibitions on Management.* Several comments related to EPA's decision prohibiting the management of CDD- and CDF-containing wastes at land disposal, incinerator, and open pile storage interim status facilities. Several commenters suggested that interim status facilities that are properly equipped and managed (*i.e.*, that meet the Part 264 standards) should be allowed to manage these wastes. Other commenters suggested that the proposed rules should be changed to allow the incineration of dioxin wastes in interim status incinerators that have approval, under TSCA, to burn PCBs. This suggestion was put forth since the process of gaining fully permitted status under RCRA would take some time. The commenters, therefore, fear that the requirement in the proposed rule would lead to a shortage of available management capacity.

The Agency continues to believe that, for these wastes, management in fully permitted facilities is preferable due to the extreme toxicity of these wastes, the persistence of the toxicants of concern, and the wastes' mismanagement history.[14] At the same time, the Agency is concerned about possible shortages in short-term management capacity for these wastes. We thus reject the suggestion that these wastes should be prohibited from all interim status facilities. We believe that certain types of interim status storage facilities can provide adequate management in the short term. Other interim status facilities, we think, can be evaluated for compliance with the Part 264 standards without undue administrative complication, and so also should not be prohibited from managing these wastes.

We do not believe, however, that interim status land disposal facilities should be allowed to manage these wastes. (There is one exception, for interim status impoundments in which these wastes are generated.) Not only are the interim status standards insufficient to prevent an unreasonable risk (see 45 FR 32682), but it is very difficult to evaluate these facilities for compliance with the Part 264 standards in the absence of a permit proceeding, because, under today's rule, land disposal facilities must seek approval of a waste management plan.

The only interim status facilities that may accept these wastes are: (a) Impoundments holding wastewater treatment sludges that are created in those impoundments as part of the plant's wastewater treatment system, (b) waste piles that meet the requirements of § 264.250(c) (referred to in this preamble as "enclosed waste piles"), (c) tanks, (d) containers, (e) incinerators if certified, and (f) thermal treatment units subject to regulation under Subpart P of Part 265, if certified. (See next Section for more detailed discussion.) However, we believe it appropriate to discuss here the management of sludges in impoundments in which the waste was created.

For surface impoundments, the Agency has determined that this is a situation when a distinction between new and existing facilities may permissibly be drawn. (See RCRA Section 3004 and 48 FR 14519). If the Agency were to ban all interim status impoundments from managing these wastes, facilities generating wastewater treatment sludges in impoundments would have to build and receive a permit for new capacity before they could legally manage these wastes. As a practical matter, this would require halting the manufacturing process for some undetermined period of time. The short-term management of these sludges in interim status impoundments could be protective, since the CDDs and CDFs will adsorb to the sludges, and other mobilizing organics will be present in these wastes at low concentrations due to dilution and biological treatment (USEPA, 1982).[15] It should also be noted that these facilities also must obtain a Part 264 permit (which includes compliance with the waste management plan), so that management at these impoundments will be upgraded as part of the permitting process. This could result, for example, in a requirement that the impoundment not be allowed to receive the wastes unless it is lined, if the permit writer concludes that there is potential for leaching from the impoundment. (See text at FN 26 below.) Thus, interim status impoundments in which these wastes are generated might not be able to continue receiving these wastes indefinitely. In addition, under the new legislation, within four years these impoundments must be upgraded to meet the technical permitting standards for new surface impoundments (subject to certain enumerated exceptions). See RCRA amended Section 3005(j). (These impoundments, however, will not be immediately prohibited from receiving these wastes as a result of this rule.) In light of all of these circumstances, we have decided to allow surface impoundments in which wastewater treatment sludges are generated to continue to manage these sludges.

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[13] EPA has re-examined its decision not to list these wastes as acute hazardous wastes, and has developed an engineering analysis for this process. (The document (which contains Confidential Business Information) is available in the docket for this rule making.) Based on this analysis, the Agency believes that wastes from the production of HCP synthesized from highly purified 2,4,5-TCP prepared by the usual route could contain TCDDs. However, since there are no present producers of HCP using this route, the wastes from HCP production are not listed. The Agency is aware of a new route of synthesis for 2,4,5-TCP during which no CDDs or CDFs are formed (CBI information).

[14] We are, however, allowing the residue resulting from the incineration or thermal treatment of dioxin-contaminated soil to go to interim status facilities. See Section VI.C for discussion.

[15] One facility, that used to produce PCP, estimated that process wastewater could contain various chlorophenols at <100 to >1000 ppm. However, these data are estimates submitted to the Agency, and were not verified by sampling and analysis. Because they differ greatly from sampling data at other facilities, they are judged to be too unreliable for use in the present context.

The suggestion that land disposal facilities which meet the requirements for fully permitted facilities be allowed to handle these wastes is reasonable only in theory. The evaluation process presently needed to ascertain whether a facility meets the requirements of Part 264 would need to be thorough, and EPA judged that, in terms of necessary documentation and public participation, the process of ensuring this fact would be equivalent (or virtually equivalent) to the evaluation needed for issuing a Part 264 permit. This is particularly true for preparing and evaluating the waste management plan. This plan must be discussed with the permit writer; there is no way a facility can be evaluated in advance to determine if they meet this standard. EPA thus believes that there is no reason for either applicants or EPA to go through the permitting process twice.

We generally agree that allowing these wastes to be disposed of only at fully permitted facilities (except as discussed below) will, in the short term, lead to a shortage of facilities able to handle these wastes. This problem will be alleviated, as is the case at present, by the possibility of storage in tanks, containers, or enclosed waste piles at interim status facilities. Such storage will not in the short term be harmful to human health or the environment, and will reduce the pressure to permit a facility to handle these wastes immediately without a full evaluation of the facility's performance. Interim status incinerators will also be allowed to burn these wastes if they can demonstrate compliance with the performance standards for fully permitted incinerators (including destruction and removal of principal organic hazardous constituents in the waste). Likewise, interim status thermal treatment units can also be approved to handle these wastes.[16] The Agency also may issue emergency permits (see 40 CFR 270.61) to facilities to store these wastes in situations where there is no other realistically available management capacity. For example, if no management capacity is available following a dioxin waste clean up, an emergency permit could be issued to a facility if the alternative is to leave the wastes in place in an unsecure setting.

B. Interim Status Facilities Allowed To Manage These Wastes

Two persons commented on EPA's proposal to allow interim status facilities to handle these wastes. One of them stated that the Agency should, at a minimum, require submission of a Part B application; a demonstration, with respect to surface impoundments, that the wastes will not migrate; and notification to the Regional Administrator on the part of interim status facilities handling such wastes.[17] The commenter further stated that management in unlined impoundments should not be allowed. In view of the fact that we will require a waste management plan for fully permitted land disposal facilities, one commenter also questioned how EPA can allow interim status land disposal facilities to handle these wastes.

As discussed above, EPA agrees that for these wastes, management at fully permitted facilities is preferable. However, as outlined above, pragmatic as well as environmental considerations motivate the Agency to allow interim status facilities to manage some of these wastes for an interim period under some conditions.

In the case of surface impoundments in which the wastewater treatment sludges are generated, we have determined that the manufacturing facilities now generating the listed wastewater treatment sludges would probably have to close down until they can obtain permits for their impoundments or build alternative treatment facilities. (See 46 FR at 14519.) In addition, and as described above, allowing these interim status surface impoundments to store or treat these wastewater treatment sludges should present a limited risk in the short-term due to the reduced potential of the CDDs and CDFs to migrate into the environment. These impoundments, however, must obtain a Part 264 permit which will include whatever requirements are imposed by the waste management plan.

EPA also judges that interim status tank and container storage facilities provide adequate short term management of these wastes. Although not providing maximum protection, they do provide control of these wastes to prevent them from posing a substantial environmental hazard or an unreasonable risk in the interim: tanks or containers at interim status facilities that will accept these wastes must meet most of the requirements required for fully permitted tank and container facilities. See, e.g., §§ 265.171, 265.173, and 265.174 (containment, management, and inspection of containers) and §§ 265.192 and 265.194 (containment and inspection of tanks).

In addition, the Agency judged that storage in interim status enclosed waste piles also represents a minimal, and acceptable risk. By "enclosed waste pile" we mean a pile that meets the requirements of § 264.250(c)—namely, that the pile is inside a structure that provides protection from run-on, precipitation, and wind dispersal, does not generate leachate, and does not contain free liquids. This regulation allows enclosed waste piles to accept these wastes without first obtaining a permit, because enclosure of this type will guard in the short-term against the exposure pathways of concern (run-off, wind dispersal, and leaching). Allowing this type of interim status facility to accept these wastes should help provide necessary management capacity until disposal facilities receive permits to manage these wastes.

The Agency also believes that interim status incinerators that are evaluated by EPA to determine whether they can meet the performance standards for these wastes contained in § 264.343 will provide adequate protection to human health and the environment (see Section IV. B. 2. for detailed discussion on the use of interim status incinerators to burn these dioxin wastes). Similar considerations justify allowing interim status thermal treatment units subject to regulation under Subpart P of Part 265 to

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[16] The Agency must provide some legal means of handling these materials while disposal capacity is made available through the permitting program.

[17] As already indicated, all persons who generate, transport, treat, store, or dispose of these CDD/CDF-contaminated wastes are required to notify EPA of their activities under Section 3010 of RCRA. It should be noted that the newly enacted HSWA creates statutory deadlines for submission of Part B applications by facilities having interim status. See newly amended Section 3005(c). Under the statute, land disposal facilities must submit applications by November 8, 1985, incinerators must submit applications by November 8, 1986, and all other facilities must submit applications by November 8, 1988. A facility which fails to meet these deadlines will, under the statute, lose interim status.

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receive these wastes. (Examples are pyrolysis units not designed as incinerators.) These units will be evaluated the same way as interim status incinerators, and, thus, must be certified as meeting the applicable performance standards in § 264.343 (including the 99.9999% DRE for POHC's in the waste). Procedures for obtaining certification likewise will be the same as for interim status incinerators. Another reason for allowing these interim status thermal treatment facilities to receive these wastes is that there are presently no Part 264 permit standards for these facilities. A prohibition on interim status facilities consequently, would prohibit these facilities from receiving these wastes at all. This result is unwarranted since a means exists to evaluate their compliance with the most important environmental standard, and these facilities may prove to be one of the optimal means of managing these wastes. Managing these wastes at these types of interim status facilities is therefore judged to present minimal risks until final permits are issued.

Several commenters stated that interim status facilities should be allowed to handle wastes containing PCP, since these wastes do not contain TCDD, other CDDs do not pose substantial risks of chronic or acute toxicity, and there is no history of mismanagement of these wastes.

We generally agree that wastes derived from the production or manufacturing use of PCP are unlikely to contain 2,3,7,8-TCDD or other TCDDs or TCDFs at levels of concern. These wastes, however, are likely to contain high concentrations of HxCDDs and HxCDFs—the PCP in these wastes is contaminated with these potent carcinogens. While we agree that these congeners are less toxic than 2,3,7,8-TCDD, we believe them to be sufficiently toxic to warrant the designation of wastes containing these substances as acute hazardous wastes. (The reasons for this determination were outlined earlier in this preamble.)

In addition, there is a substantial history of mismanagement of wastes (including spilled or abandoned formulations) resulting from the use of PCP in wood treatment processes. These wastes, or very similar wastes, have been mismanged repeatedly, causing very serious damage incidents. There have been many actions under RCRA and CERCLA involving wood treatment facilities using PCP solutions and wood preservation wastes; in addition, there are 22 damage incidents involving these chemicals at sites on the National Priorities List for Actions under CERCLA. These mismanagement incidents (outlined in the revised Background Document for this listing) include discharge of process wastes into off-site drainage ditches, storage (in most cases for many years) of such wastes in impoundments which were improperly sited, improper storage of treatment solutions in leaky tanks and containers, etc. These mismanagement incidents resulted in PCP contamination of soil, surface water, and ground water; in several instances, this contamination was at very high levels. In one instance, the soil of a residential area surrounding a wood treating facility that mismanaged these wastes was analyzed for HxCDDs and HxCDFs. In four samples, HxCDDs ranged from 1.5 to 12 (average, 4) ppb, while HxCDFs were present at 1.7 to 21 (average 9.5) ppb. The clean up of these contaminated sites can be quite costly.

Because these wastes are very toxic, because the toxic components of the waste are mobile, persistent and (particularly the HxCDDs and HxCDFs) will bioaccumulate, and because of their history of mismanagement, EPA judges that they must be managed at fully permitted facilities when land disposed, incinerated (except as already discussed), or stored in open piles.

2. Requirement of a Waste Management Plan

Several respondents commented on EPA's proposal to require a waste management plan to specify additional requirements for land disposal facilities intending to manage these wastes. Most agreed that such a requirement is desirable. (In fact, one commenter stated that a waste management plan should be required for all management options for these wastes.) However, several respondents stated that a waste management plan would not be adequate to ensure proper handling of these wastes. Still others stated that interim status facilities which meet the Part 264 requirements should be allowed to submit such a plan (and thus be able to handle these wastes) before receiving a final permit.

After reviewing these comments, the Agency still believes that a waste management plan will help provide assurance, as far as is practically possible, that these wastes are properly managed in a land disposal situation. The waste management plan will be the interim vehicle for assuring individualized consideration that the wastes will be managed safely. The plan must be submitted by the owner or operator of the facility as part of the permit application.[18] Therefore, it will be considered in the normal course of the permitting process, so that no special EPA review procedures are required.

The waste management plan should address the factors mentioned at proposal (see 48 FR at 14520) including waste volume, concentrations of CDDs and CDFs in the waste, aerosol/particulate dispersion, violatilization of the toxicants of concern, soil attenuation properties, waste leaching potential, and anticipated solvent co-disposal. To assist the owner or operator in preparing this document, EPA will provide detailed guidance for the presentation of a waste management plan. This document will discuss the physiochemical properties of the waste constituents, and the specific factors to be addressed for disposal of these wastes at each type of land disposal facility (*i.e.*, land treatment units, surface impoundments, open waste piles, and landfills). The document will explain (1) how the existing Part 264 standards should and can be implemented for these wastes where specific guidance is appropriate (*i.e.* wind dispersal, liner compatibility) and (2) what *new* requirements should be imposed for such wastes (*e.g.* soil types, co-disposal, etc.).

More specifically, this guidance document will address a number of areas where existing regulations already provide adequate control. However, due to the extreme toxicity of the toxicants in these wastes, further guidance is provided to the permit writer and the owner or operator of the land disposal facility on how the existing regulations can be applied to these wastes. For example, the existing management standards under Part 264 are adequate to prevent the dispersion of the CDDs and CDFs by wind dispersal. See §§ 264.221, 264.250, 264.273, and 264.301. However, because of the toxicity of the CDDs and CDFs, the waste management guidance document will provide specific management techniques for controlling this exposure pathway (*i.e.*, immediate cover of wastes when placed in landfills and open waste piles, air monitoring to ensure compliance with this provision, etc.). In addition, the existing regulations already address liner compatibility. See §§ 264.221, 264.251, 264.301, and 264.302. However, the waste management guidance document includes a discussion of an advanced liner design system to assist the Region and the owner or operator of the land disposal facility to comply with these provisions.[19]

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[18] Sections 270.17, 270.18, 270.20, and 270.21 of the hazardous waste regulations have also been amended to include the specific Part B information requirements concerning the waste management plan that must be included in the permit application for surface impoundments, non-enclosed waste piles, land treatment units, and landfills.

In addition to the existing standards, we believe that additional requirements (for which the existing rules do not address) also need to be considered in land disposing these dioxin-containing wastes. Therefore, the waste management guidance document will discuss the types, the additional factors the permit writers should consider in approving the waste management plan. In particular:

(1) *Co-disposal*—The appropriateness of disposing of the dioxin-containing wastes with other wastes that may increase the solubility of the CDDs and CDFs. In general, we believe that it is more desirable to mono-dispose these wastes.

(2) *Soil Types*—The appropriateness of using various soil types at land disposal facilities. In particular, we believe these wastes should be disposed of in facilities with underlying soil of high sorptive capacity for organic chemicals (*i.e.*, high organic carbon content) and low permeability; this could be accomplished by bringing soils with high sorptive capacity and low permeability to a particular site.

(3) *In-situ Treatment*—The appropriateness of using in-situ treatment, such as mixing with carbon or other sorbents, to minimize the migration potential of the CDDs and CDFs, and the formation of free liquids.

(4) *Liners*—The appropriateness of disposing of these wastes in unlined units. In general, we believe that these CDD and CDF-containing wastes should not be stored or disposed of in unlined units.[20] This does not mean that owners or operators of existing facilities will need to retrofit the facility to put in liners. Rather, we expect that the permit writer would preclude placing these wastes in unlined units after a specified date. Permittees wishing to continue placing wastes in the unit would have the option of lining the unit.

With respect to the other comments, we believe that it is neither necessary nor appropriate to require incinerators, thermal treatment units, tanks, containers, or enclosed waste piles to submit a waste management plan. For incinerators, the requirement (see below) of a trial burn showing 99.9999% (six 9s) destruction and removal efficency (DRE) is adequate protection for proper incineration of these wastes. The same is also true for thermal treatment facilities. The regulatory requirements for tank, container, and enclosed waste pile storage facilities likewise provide the Agency with sufficient information to evaluate the storage facility's ability to contain these wastes, and the additional requirement for secondary containment for such facilities (see Section IV. A.4. below) provides further protection.

We also do not agree with the suggestion that interim status facilities be allowed to submit a waste management plan and manage these wastes. (See, also, Section IV. A. 1. above rejecting the suggestion that interim status facilities meeting the requirements of fully-permitted facilities be allowed to accept these wastes.) We have determined that interim status facilities, in general, should not be allowed to manage these wastes. In fact, where management at interim status facilities is allowed, EPA expects to issue permits quickly, in order to limit the interim status period. Therefore, the Agency will not allow interim status facilities that have submitted a waste management plan to manage these wastes.

3. Prohibiting Land Disposal of These Wastes

Several commenters suggested that land disposal of these wastes should be prohibited except "in exceptional circumstances." One person, however, felt that a better approach would be to develop a "level of concern" (LOC) above which all dioxin-containing wastes should be prohibited from land disposal; however, the commenter did not specify what such a level should be.

The recently enacted legislation gives the Agency two years to determine whether these wastes should be banned from some or all types of land disposal, except for underground injection in which the Agency has 45 months to make such a decision, and the cicumstances under which they should be banned. The Agency has recently initiated a program to explore whether certain hazardous wastes should be restricted from some or all types of land disposal, what the nature of the restrictions should be, and what treatment and recycling alternatives exist for such wastes. CDD/CDF-containing wastes are currently being examined under this program for possible restriction. For more details on this program, see the Advance Notice of Proposed Rulemaking published on February 15, 1984, at 49 FR 5854. In addition, as discussed in the April 4 proposal for this regulation (48 FR 14521), EPA is considering developing special management standards for CDD/CDF-contaminated wastes in addition to the special standards required by today's rule. It is possible that our investigations may enable us to define concentration limits within which land disposal should be prohibited. However, until these studies are completed, we believe it inappropriate to make any decision with respect to prohibiting these wastes from land disposal.

4. Secondary Containment at Permitted Tank and Container Storage Facilities

EPA solicited comments as to whether secondary containment for tanks that store or treat CDD- and CDF-contaminated wastes should be required as part of their permit. (Interim status facilities would not be subject to this requirement.) As justification, we cited the wastes' toxicity as well as long storage periods, and described mismanagement incidents involving both containers and in-ground and above-ground tanks. Some commenters disagreed with such a requirement and argued categorically that secondary containment requirements at such facilities are not warranted. However, many other commenters argued just as strongly that secondary containment requirements are needed, and urged their adoption.

We have decided that secondary containment should be required as a permit requirement for all tanks that treat or store these wastes presently subject to the existing tank design and operating standards in 40 CFR Part 264, Subpart J, namely above-ground and in-ground tanks, and all underground tanks that can be entered for inspection. It is the Agency's intent to guard against the risks posed by storing or treating these wastes in all types of tanks, including covered underground tanks that cannot be entered for inspection. However, this latter type of tank is not presently subject to the Part 264 Subpart J requirements (see § 264.190(b)) and, as such, cannot receive a permit to treat or store these wastes. In addition, the use of secondary containment at such facilities was not explicitly discussed in the April 4, 1983 proposal. Therefore, we believe we must first solicit public comment on our intent to require secondary containment at covered

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[19] It should be noted that this guidance document may also be appropriate for other hazardous wastes that contain similar hazardous constituents (i.e., chlorophenols).

[20] As already discussed, we will allow sludges that are generated in interim status surface impoundments (even if unlined) as part of the plant's wastewater treatment system to manage these wastes. These impoundments are subject to all Part 264 standards, however. Thus, the permit writer will address whether it is appropriate for unlined impoundments to continue to receive these wastes.

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underground tanks that cannot be entered for inspection that handle CDD- and CDF-contaminated wastes. We intend to address this issue in forthcoming regulations dealing comprehensively with management standards for tanks.

We believe that the secondary containment requirement for the storage or treatment of these wastes in tanks is justified based on the following three considerations: (1) When released into the environment, it is well-documented that these extremely toxic wastes present a substantial hazard to human health or the environment; (2) these wastes may be stored for a long time before a disposal or incineration facility is found that is willing or able to accept them (for example, the same wastes at the Vertac facility have now been stored on-site for nearly ten years); and (3) EPA's experience indicates that these wastes are particularly difficult and expensive to cleanup when spilled, and therefore warrant the additional protection afforded by secondary containment.

For the same reasons cited above, we believe that secondary containment should be part of the permit requirements for all facilities that store CDD- and CDF-containing wastes that are not free liquids in containers. (EPA specifically solicited comments on this approach in the proposal, but commenters did not reach a consensus on this issue. Some commenters supported it while others opposed this aspect of the proposal.) Accordingly, all the present requirements for secondary containment will apply to container storage facilities, except for the waiver provision in § 264.175(c). This waiver allows an exemption from the secondary containment requirements for non-liquid wastes, an exception which we believe should not apply to container facilities storing CDD/CDF-contaminated wastes. Rather, we have concluded that all possible releases of these wastes to air, ground water, and surface water from such facilities must be prevented. Therefore, a waiver of secondary containment requirements for containers will not be allowed. A container storage area must have a base which is sufficiently impervious and continuous to prevent spills or leaks of these non-liquid wastes into the environment.

With respect to tanks, we have chosen to implement the secondary containment requirement through a general performance standard. Therefore, the rule does not specify the types of designs for the containment system, but rather requires the owner or operator to choose a design and propose it in the RCRA permit application for EPA review. Under new § 264.200(a), facilities seeking permits for tanks that store or treat these wastes must have a system designed and operated to detect and adequately contain spills or leaks from the tanks. The design of acceptable containment and detection systems can vary considerably according to the type of tank and other factors, as discussed below.

An example of a containment system that might be acceptable for a tank situated above-ground is one with an impervious base (such as concrete, or a synthetic liner) underlying the tank, and walls or dikes around the tanks that provide containment for at least 100% of the design capacity of the largest tank in the containment area. This is to prevent release of CDD- and CDF-contaminated wastes into the environment from the tank in the event of a complete (worstcase) tank failure. The Agency does not believe that the regulations need protect against the extremely remote possibility of simultaneous multiple tank failures in one containment area. Each containment system must also have a method of mechanical or visual detection that will identify leaks of CDD- and CDF-contaminated wastes from the bottom of the tank.

An example of a containment system that might be acceptable for an in-ground tank is one with a synthetic-type liner underlying the tank, or a liner placed inside the tank so that the tank itself provides the secondary containment. In either configuration, the containment system must be compatible with the wastes being stored, and must be installed and have sufficient strength and thickness so as to prevent failure due to abrasion, pressure gradients, or climatic conditions. A method to detect any leaks between the primary and secondary containment system must also be provided.

An example of a containment system that might be acceptable for underground tanks that can be entered for inspection is a vault structure constructed of material impervious to the wastes being stored in the tank or simply compatible with the wastes and lined or coated with an impervious material. This type of containment system must also have a method to detect any leaks from the tank.

As a general alternative to these examples of containment systems, double walled tanks equipped with an interstitial zone monitoring device to detect leaks that enter the space between the walls would also be considered acceptable for meeting the new standard prescribed in §264.200(a).

Today's rule requires tank facilities storing or treating CDD- and CDF-containing wastes to provide EPA with information in its permit application specifying: The precise design of the secondary containment system and its accompanying leak detection method; the choice of construction material and specifications; and whether additional run-on or precipitation controls are needed to preserve the system's integrity. These new technical information requirements are specified in new § 270.16(g) and must be addressed by each individual facility in its RCRA permit application. This information will be evaluated by EPA before a permit is issued.

With the addition of today's secondary containment requirements, we have also decided it is necessary to require tank facilities storing CDD/CDF-containing wastes to address in the facility contingency plan the steps to be taken should a leak be detected. When a leak is detected, the owner or operator must act promptly to prevent release of the hazardous waste into the environment, and wastes must be removed from the secondary containment system as soon as possible. The plan also needs to specify how the tank will be removed from service and repaired, if there is a leak and containment is breached. These new steps are provided in revised § 264.194(c) and build upon the procedures that already must be specified in the contingency plan under existing § 264.194(c).

It should be noted that today's action should not be viewed as a determination by EPA that secondary containment requirements are only appropriate for tanks that store or treat CDD- and CDF-containing wastes. EPA is presently considering whether to require secondary containment for hazardous waste storage and treatment tanks, including tanks that have not yet been permitted and that are presently covered under the existing Part 265 interim status standards. In addition, we are also considering whether to propose several more requirements that we believe are needed to more adequately control the risks posed by all hazardous waste storage and treatment tanks, including those that store or treat CDD- and CDF-containing wastes. For example, EPA is presently evaluating the need for a secondary containment system at all hazardous waste tanks that would provide containment of more than just leaks in the tank's shell. Possible hazardous waste discharges to the environment that EPA believes may also warrant secondary containment include leaks from nearby tank ancillary equipment (*e.g.*, valves, pumps, and flanges in close proximity to the tank) and spills of hazardous waste in the area immediately surrounding the tank from overflows of the top of the tank or from tank in-filling practices (both caused by equipment failure or operator error). An example of another requirement presently being considered by the Agency is secondary containment for all generators storing or treating hazardous waste in tanks or containers for less than 90 days without a RCRA permit under § 262.34. The Agency believes that leaks and spills at such facilities are no less prevalent than at other RCRA tank facilities and therefore may warrant similar secondary confinement requirements.

B. Incineration of Dioxin-Contaminated Wastes

1. Burning at Interim Status Incinerators

As discussed in the April 4, 1983 proposed rule, EPA does not believe that current regulatory controls on interim status incinerators are sufficient to limit the risks associated with dioxins. Interim status incinerators are not required to meet the performance standards for destruction and removal efficiency, HCl removal, and particulate emissions that are necessary to prevent an unacceptable level of risk from burning these wastes. In addition, they are not subject to the rigorous scrutiny of operating and management procedures that result from the RCRA permit review process. Thus, the final regulations prohibit combustion of these wastes in incinerators that have only interim status.

We have decided, however, to allow interim status incinerators to burn these wastes without first obtaining a RCRA permit if they are certified by the Assistant Administrator for Solid Waste and Emergency Response as satisfying the performance standards in Subpart O of Part 264 for RCRA incinerators burning these wastes.[21] In addition, there must be an opportunity for public comment on EPA's determination before the determination becomes final.

We are allowing this exception because we think incinerators meeting these conditions are virtually as protective as those receiving Part 264 permits,[22] and to provide additional incineration capacity for these wastes until there are more fully-permitted RCRA incinerators. Interim status incinerators that have been approved under the Toxic Substances Control Act (TSCA) to burn polychlorinated biphenyls (PCBs) are a type of incinerator that may wish to apply for certification. As pointed out by commenters, PCB incinerators are a logical choice to burn these wastes without first receiving a RCRA permit because they are required to meet the same performance standard (99.9999% destruction and removal efficiency) that we are requiring for the dioxin and dibenzo-furan-containing wastes, and PCB's, in some cases, are more difficult to incinerate than the dioxins and dibenzofurans. (See Section IV. B. 2. b. below.)

We accordingly are promulgating a new § 265.352(a) stating that RCRA interim status incinerators may burn these wastes if they meet the conditions outlined above. Procedures for applying and obtaining a certification are found in § 265.352(b). Applicants should submit information to the Assistant Administrator for Solid Waste and Emergency Response demonstrating that they can meet the performance standards in Part 264. The most pertinent data is that required by § 270.19(b) and (c), and, if a trial burn is necessary, § 270.62. The Assistant Administrator for Solid Waste and Emergency Response will make a tentative finding whether the applicant can meet the Part 264 performance standards. These tentative findings will be submitted for public comment, and persons in the vicinity will be notified by newspaper announcement and radio broadcast (this last requirement is consistent with the § 124.10(c)(2)(ii) notice procedures for RCRA permits). The comment period will remain open for 60 days. At the end of that time, the Assistant Administrator for Solid Waste and Emergency Response will issue a decision whether or not to certify the incinerator. This decision is final Agency action. Any facility receiving a certification, however, must still obtain a Part 264 incineration permit.

A number of commenters stated that the complexity in complying with the standards in Subpart O and the time required to obtain a full RCRA permit would, in the short term, limit the locations where these wastes could be incinerated, creating a capacity short fall. We believe that the potential problem should not become severe. First, the wastes to which this restriction applies are generated in relatively small quantities. Secondly, as discussed above, we are allowing interim status incinerators that have been certified by the Assistant Administrator for Solid Waste and Emergency Response to burn these dioxin wastes. Finally, an owner or operator of an interim status incinerator who wishes to incinerate these wastes can speed up the permit process by voluntarily submitting the Part B of their permit application instead of waiting until the permitting official requests that it be submitted. This should reduce the time lag and give more incinerators the capability of burning these wastes.

2. Burning at Fully-Permitted Incinerators

The proposed rule also discussed the management of these wastes at fully permitted incinerators. It was EPA's initial view that burning these wastes in an incinerator which has a proven capability to assure 99.99% destruction and removal efficiency (DRE) for the principal organic hazardous constituents (POHCs) which are as difficult, or more difficult to incinerate than the CDDs or CDFs, was sufficiently rigorous to ensure the proper management of these wastes. However, we specifically requested comments concerning the possibility of requiring a DRE greater than 99.99% when these wastes are incinerated. The Agency also discussed the possibility of requiring special notification to the Regional Administrator when a facility burns these wastes.

a. Alternative DRE for Dioxin-Contaminated Wastes. While some commenters were opposed to changing the present DRE requirement, most of the comments focused on more stringent standards, *i.e.*, 99.9999% (six 9s) DRE. The commenters pointed out that six 9s DRE is required of incinerators burning polychlorinated biphenyls (PCBs) (40 CFR 761.70) compounds that are less toxic than the CDDs and CDFs. They argue that, since CDDs and CDFs are among the most toxic compounds known, nothing less than the best achievable performance should be required. In addition, they argued that six 9s DRE will result in the lowest achievable emission rate. Furthermore, one commenter submitted risk modelling data indicating that a large incinerator burning wastes containing 20 parts per million of TCDD with a 99.99% (four 9s)

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[21] It should be noted that some type of test burn data will be required which demonstrates that the incinerator achieves 99.9999% destruction and removal efficiency (DRE) before the incinerator would be certified. See Section IV.B.2.b. below.

[22] The only significant difference is that these incinerators would not yet be evaluated to determine if they meet the facility standards in Subpart A through H of Part 264. (Most of these standards, however, are required by the Part 265 interim status standards.)

DRE could result in ambient air concentrations which could present a public health hazard for residents living in the facility's immediate vicinity.

In evaluating these comments, the Agency conducted its own risk assessment in order to determine the potential risks from burning these wastes at different levels of performance in certain hypothetical situations. As part of this analysis, EPA evaluated the potential risks presented by the TCDD content of the wastes, and by the content of total CDDs and CDFs. The latter analysis assumed that the CDDs and CDFs *in toto* have thirty times the carcinogenic potency of TCDD. (This may not be a very conservative assumption, since, for the soot generated in the Binghamton, NY PCB transformer fire, it was estimated that the CDDs and CDFs present had 58 times the carcinogenic potency of TCDD (Eadon, 1982).) If only the HxCDD components are considered, the potential carcinogenic risks are about one twenty-fifth of those calculated for the TCDD component, since that is the ratio of their carcinogenic potencies. The risk to the maximum exposed individual [23] and the average exposed individual was then estimated. The variables examined were the concentration of the dioxins in the feed, the size of the incinerator, and the DRE (which ranged from 99.00% to 99.9999%).

The conclusions reached from this effort indicated that wastes containing ppm concentrations of TCDDs, HxCDDs or CDDs/CDFs, burned in large incinerators achieving four 9s DRE could result in ambient concentrations that present a lifetime excess cancer risk level of 10^{-4}. With small incinerators, lower feed rates, lower (ppb) dioxin concentrations, or better meteorological conditions, the modelling showed that four 9s DRE provided levels of risk lower than 10^{-6}.

Based on these results, the Agency considered three options. The first was to establish "acceptable" levels of risk and to use risk modelling on a case-by-case basis to set limits on the waste concentration or feed rate for each incinerator; the second option was to leave the standard at 99.99% DRE; the third option was to establish a performance standard of six 9s DRE, the current standard for PCB wastes.

The first option is now effectively precluded by statute. See RCRA amended Section 3004(o)(1)(B) stating that facilities receiving permits after enactment of the Hazardous and Solid Waste Amendments of 1984 must at a minimum meet the 99.99% DRE standard. The Agency also rejected the first option because, while it is theoretically more precise from a conceptual standpoint, and allows for tailoring of the regulation to specific circumstances, it is extremely resource intensive for the government, the regulated community, and the interested public. It also requires agreement on the models, assumptions, and acceptable risk levels. Since such modelling is inherently subject to debate, EPA questions its practicality for case-by-case applications in this context.

As described above, a four 9s DRE could result in risk levels for certain situations that are in a range that is of questionable acceptability. Partly because of this, we have decided to impose a more stringent performance requirement of six 9s DRE for CDD/CDF wastes. In addition, this level of destruction and removal is technically feasible. Incinerators burning PCBs are required to operate under conditions that result in six 9s destruction. Consistent destruction to six 9s have been measured at a number of incinerators (*e.g.*, those of SCA, Inc. in Chicago, IL; Rollins Environmental Services, in Deer Park, TX; the facilities operated by Energy Systems Company in El Dorado, AR; and by the General Electric Corporation in Waterford, NY (MRI, 1983; USEPA, 1981c and 1981d)). Similar DRE's are expected to be achievable for CDDs and CDFs, since PCBs, and CDDs, and CDFs have a similar degree of incinerability. (See Table I below.) The second factor is one of general environmental policy. If one is to incinerate waste containing one of the most toxic substances known, one should use the best incinerators operating at their peak capability. (See, for instance, 46 FR at 7666, January 23, 1981.) Several commenters made this point, including a commenter for a facility that incinerates hazardous waste commercially. In addition, the decision is reinforced by our estimate that, in certain situations, the other principal technological option (four 9s DRE) might not be sufficiently protective of human health.

b. Requirements for Conducting a Trial Burn for These Wastes. One commenter argued that incinerators burning these wastes should be required to demonstrate compliance with the incinerator performance standard for organics by conducting trial burns for dioxins, rather than by using a surrogate Principal Organic Hazardous Constituent (POHC) that is more difficult to incinerate. The commenter also argued that trial burns should be conducted on waste matrices physically similar to those that would be burned.

Although the commenter's point is desirable in theory, determining compliance with a six 9s DRE (or even a four 9s DRE) standard for these wastes would be very difficult, if not impossible, without a system for surrogate POHCs as established in § 264.342. The concentrations of the CDDs/CDFs in these wastes are too low to find measurable amounts in the stack gas (at six 9s DRE) at present limits of detection, and public health considerations preclude, in most cases, "spiking" the waste with higher concentrations of CDDs or CDFs. Therefore, it is not possible to measure and calculate a six 9s DRE using CDDs/CDFs as the principal organic hazardous constituents (POHCs) with the needed accuracy. However, by selecting a POHC in the waste mixture or by spiking the waste with a compound that is more difficult to incinerate than the CDDs and CDFs, and that is present in sufficient concentrations to determine a six 9s DRE, it is possible to use a trial burn to predict compliance with a six 9s DRE for the CDDs and CDFs.

We also agree with the commenter that the waste mixture used for the trial burn should, as nearly as possible, be in the same physical matrix as the wastes to be routinely burned (see § 264.345(b) indicating that incinerator permits will allow variations in the waste feed physical properties so long as the variations will not affect compliance with the incinerator performance standards), and the waste should be fed into the incinerator at the same rate. For example, if the CDD/CDF wastes that are to be incinerated are contained in a sludge, the trial burn should be conducted on a similar sludge containing the POHC selected to prove compliance. Additional information concerning POHC selection and physical state is contained in the "Guidance Manual for Hazardous Waste Incineration Permits", SW-966 (July 1983).

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[23] A person who spends 24 hours a day, 365 days a year for 70 years at the site of maximum ground level concentration. This person weighs 70 kg, breathes 20 m^3 of air per day, and retains 50% of all contaminants inhaled. It was also assumed that the incinerator burns the waste consistently for the 70-year exposure period, and that "worst case" meteorological conditions would prevail. Obviously, these are conservative assumptions. However, this analysis does not consider other sources of exposure, the possible synergistic effects of concurrent exposures to other carcinogens, or the fact that some of the POHCs, such as chlorobenzenes and chlorophenols, can, in the course of incineration, give rise to CDDs and CDFs. Thus, like all risk assessments, this analysis represents a rough balance of factors relevant to potential injuries.

EPA uses heat of combustion as its incinerability hierarchy. Table I lists the heats of combustion of the CDD and CDF homologues, as well as of PCB homologues and a few compounds commonly selected as POHCs. The lower its heat of combustion, the more difficult a compound is to incinerate.

c. Special Notification to the Regional Administrator. In the proposal, EPA considered requiring owners or operators of incineration facilities burning these wastes to notify the Regional Administrator of that fact. Such notification was considered because it was felt that Regional authorities might wish to determine compliance monitoring priorities for facilities incinerating these wastes. Although a few commenters did not believe that a notification requirement is necessary, most of the commenters felt that such a requirement is important and should be required. The requirement of a six 9s DRE standard for these wastes will, in most instances, require a trial burn and full permit issuance procedures. Thus, the Regional Administrator will, in most instances, be aware that a facility may burn these wastes. However, this is not true in all cases. If an incineration facility has a permit based on trial burn data showing six 9s DRE capability for a substance more difficult to decompose than the CDDs or CDFs (*e.g.*, trial burn data showing six 9s DRE for certain PCBs) there would be no need to inform the Regional Administrator that the facility plans to burn CDD/CDF wastes. EPA will, therefore, require owners or operators of incinerators managing these wastes to notify the Regional Administrator of that fact.

d. Periodic Compliance Tests. A few commenters suggested or implied that incinerators burning CDD/CDF wastes should undergo periodic performance verification. Repeating the trial burn on some periodic schedule might be reasonable in cases where strict operating parameters are not established. For example, under the Clean Air Act, a stack could not emit more than some amount of pollutant per given time. No specific operating parameters are established by the regulators, and, instead, periodic compliance checks are conducted.

TABLE I

Compound	Heat of combustion (kcal/gm)
Chlorinated Dibenzo-p-Dioxins	
Tetra	3.46
Penta	3.10
Hexa	2.81
Chlorinated Dibenzofurans	
Tetra	3.66
Penta	3.40
Hexa	3.07
Chlorinated Biphenyls	
Mono	7.75
Di	6.36
Tri	5.10
Tetra	4.29
Penta	3.66
Hexa	3.25
Hepta	2.98
Octa	2.72
Typical POHCs	
Tetrachloromethane	0.24
Tetrachloroethane	1.39
Hexachlorobenzene	1.79
1,1,1 Trichloroethane	1.99
Pentachlorophenol	2.09

In contrast, during the RCRA permit process, very carefully chosen operating conditions are established in the permit. These conditions, measured during the trial burn, establish the range of operating conditions of the incinerator, within which it has been determined to meet the performance standards of Subpart O. Should it operate outside this range, it would not be in compliance with the standards and would have to stop incinerating the waste. In addition, if the owner or operator wishes to change any of the critical operating parameters, they would have to request a permit modification, and have to conduct another trial burn to prove compliance with the standards under different operating conditions. Therefore, we do not believe it necessary to require periodic testing.

3. Amendments to Parts 264 and 265

Today's notice amends § 264.343 to require that incinerators burning the listed CDD/CDF-containing wastes must achieve a DRE of 99.9999% in addition to the other standards contained in Subpart O. The amendments specify that six 9s DRE will be measured on a POHC that is more difficult to incinerate than the particular CDDs or CDFs. For example, using the heat of combustion hierarchy, and burning wastes containing, for example, HxCDD, a POHC would be selected with a heat of combustion less than 2.81 kcal/gm—perhaps 1, 1, 1, trichloroethane. The permit application procedures in Part 270 and permit issuance procedures in Part 124 are not changed by today's amendment. For a new incinerator (or an interim status incinerator seeking certification), the trial burn plan would show how the unit will be operated so as to comply with the standards in Subpart O including the requirement for six 9s DRE. EPA expects that the permit for a new incinerator would not allow any of the listed CDD/CDF-containing wastes to be burned until the trial burn is complete and final operating conditions are established. In addition, none of the listed CDD/CDF-containing wastes should be burned during the pre-trail burn and post-trial burn periods described in §§ 264.344 and 270.62 which provide that the Regional Administrator place limits on the feed to the incinerator until assurance is provided that the unit can meet the standards.

If an incinerator already has a RCRA permit, it may burn CDD/CDF wastes (provided the owner or operator has notified the Agency of this fact) if its previous trial burn, or data in lieu of a trial burn, demonstrates a six 9s DRE on a POHC or compound more difficult to incinerate than the CDDs or CDFs in the waste. This may be the case for incinerators that have TSCA permits for PCB destruction. During the trial burn for PCBs, the unit would have had to ascertain six 9s DRE on a specific chlorinated biphenyl, or a compound that is more difficult to incinerate than the chlorinated biphenyl in the waste. If this chlorinated biphenyl or the surrogate is more difficult to incinerate than the CDDs or CDFs in the waste feed, and if it was in the same physical state, another trial burn may not be required. For example, if an incinerator proved six 9s DRE on PCP, which has a heat of combustion of 2.09 kcal/gm, it could incinerate all the CDDs and CDFs, since the CDD/F compound most difficult to decompose is HxCDD with a heat of combustion of 2.81 kcal/gm. However, if the incinerator has not demonstrated six 9s DRE, or it had shown six 9s DRE on a POHC less difficult to burn than the CDDs or CDFs (*e.g.*, tetrachlorobiphenyl (4.29 kcal/gm)), another trial burn would be necessary, and the permit would need to be modified. For additional information see the "Guidance Manual for Hazardous Waste Incineration Permits" (*op. cit.*).

Today's notice also amends § 265.340 to exclude burning of CDD/CDF wastes in incinerators with interim status, except as previously discussed. An interim status incinerator may not burn these wastes until a permit is issued or the incinerator is certified to burn these wastes.

C. Burning at Other Interim Status Treatment Facilities

The Agency also believes that interim status thermal treatment units subject to regulation under Subpart P of Part 265 are insufficient to limit the risks associated with dioxins, just as they are insufficient to limit risks associated with interim status incinerators (*i.e.*, most of the requirements address administrative rather than technical controls). However, the Agency also believes that means exist to determine their environmental performance. Therefore, we will allow interim status thermal treatment units to be certified if they can demonstrate that they can properly treat these wastes.

Under the existing regulations, these units cannot be permitted since there are no existing RCRA permitting standards. However, such treatment units may provide a very promising way of treating these wastes. In particular, a number of emerging thermal treatment technologies may be used to treat CDD/CDF-containing wastes in order to render them non-hazardous (or at least, less hazardous). Some of these technologies are thought now to be practical, while others are in the pilot stage, and pilot scale field experiments need to be performed. In the absence of RCRA permit standards, such pilot scale research activities would not be allowed. This would stifle and discourage the development of new alternatives and the development of innovative technology for treatment of these very toxic wastes. We believe such an outcome is undesirable.

As a result, we have decided to promulgate a new § 265.383 stating that interim status thermal treatment units may burn these wastes if they are certified by the Assistant Administrator for Solid Waste and Emergency Response that they can properly treat these wastes. These units will be evaluated the same way as interim status incinerators, and thus must be certified as meeting the applicable performance standards in § 264.343 (including six 9s DRE for POHCs in the waste). In addition, the procedures for obtaining certification will be the same as for interim status incinerators (see Section IV. B. 1., above). In particular, the applicant must submit an application to the Assistant Administrator for Solid Waste and Emergency Response which demonstrates that they meet the applicable performance standards in Subpart O of Part 264. The most pertinent data to be submitted is the same as for interim status incinerators, that is the information cited in § 270.19 (b) and (c) and, if a trial burn is necessary, § 270.62. However, since these units are somewhat different than incinerators, additional data and information may be required. See § 270.19 (c)(7). Because the type of additional information that may be required will vary with the type of thermal treatment unit, we suggest that the owner or operator of the thermal treatment unit contact the Agency before submitting their application to determine whether any additional information will be required, and if so, what type of data will be needed. This information will then be evaluated for compliance with the appropriate performance standards. The Assistant Administrator's tentative decision will then be published (after public notification) for a 60 day comment period; at the end of that time, the Assistant Administrator for Solid Waste and Emergency Response will issue a final decision whether or not to certify the thermal treatment unit. As with interim status incinerators, this decision is final Agency action.

V. Relation of This Rule to Regulation of TCDD-Contaminated Wastes Under the Toxic Substances Control Act

Many wastes containing TCDD are presently regulated under 40 CFR Part 775, a regulation issued under Section 6 of the Toxic Substances Control Act (TSCA).[24] The relationship between that regulation and the rule being promulgated today under RCRA, was discussed at proposal (see 48 FR at 14518). At that time, we stated that the regulation of the treatment and disposal of hazardous wastes properly belongs under RCRA, and that the Agency should avoid overlapping and potentially contradictory approaches to the same problem under different regulatory authority, *e.g.*, TSCA and RCRA. In fact, Section 9(b) of TSCA provides that EPA must utilize its authority under the other environmental laws it administers where these laws are adequate to protect against unreasonable risk, and where there is no strong public interest in taking action under TSCA.

In the proposal, we argued that RCRA provides the appropriate long-term solution for controlling the management of TCDD-contaminated wastes. EPA promulgated the TSCA § 6(a) rule based on a determination that the unregulated disposal of TCDD-contaminated wastes presents an unreasonable risk of injury to health or the environment, and determined that removal for disposal of certain TCDD wastes at Vertac's Jacksonville, Arkansas site would present an unreasonable risk (see 45 FR 32680, May 19, 1980). We also determined that disposal of TCDD wastes by other persons without prior notification to EPA would present an unreasonable risk. These determinations were reached, in part, because the then existing RCRA regulations for the treatment and disposal of hazardous waste were not appropriate for TCDD-contaminated waste, since EPA had not yet developed final permit standards for the land disposal or incineration of hazardous wastes.

As explained at proposal (see 48 FR at 14518), the general RCRA regulations are now effective, and provide a means for properly evaluating the land disposal and treatment (*i.e.*, incineration) of TCDD-contaminated wastes, thus ensuring that these wastes are managed in a manner that does not present an unreasonable risk. (This also is true of those interim status incinerators and interim status thermal treatment units that are certified to burn these wastes, since these units must be able to meet the same performance standards as fully-permitted incinerators, and must notify and be evaluated by the Agency before they begin burning.) Therefore, when the RCRA dioxin waste rules are effective and the TCDD-contaminated wastes are controlled under RCRA, their disposal will no longer pose an unreasonable risk finding under TSCA. Consequently, we proposed to revoke the TSCA rule when the rule, under RCRA, becomes effective. No one disagreed with this provision of the proposal; in fact, several commenters explicitly agreed that EPA should revoke the TSCA rule. Today's action, therefore, revokes the TSCA Section 6(a) regulation that applies to the Vertac Chemical Corporation, and those that require a sixty-day notification to EPA on the part of persons wishing to dispose of TCDD-contaminated wastes.

VI. Comments on Other Issues

A. Development of a Toxicity Characteristic for Defining Dioxin-Contaminated Wastes as Hazardous

Several respondents commented on EPA's question regarding the advisability, practicality, and desirability of developing a "characteristic" definition of hazardousness under 40 CFR Part 261 for CDD/CDF-containing wastes. Several commenters agreed with EPA that this might not be a suitable regulatory alternative, adding that to set a lower limit of concern might encourage dilution as a means of circumventing regulation. Several others, however, stated that a clear indication of a lower level of concern would be a desirable regulatory goal; one commenter suggested what such a lower limit might be, stating that a 1 ppb level in soil might be a suitable level. One other commenter also suggested that a level of concern should be set as a regulatory threshold, but not as a basis for listing.

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[24] TCDD wastes are defined as those resulting from the production of 2,4,5-TCP or its pesticide derivatives, or substances produced on equipment that was previously used for the production of 2,4,5-TCP or its pesticide derivatives.

On reconsideration of the advantages and disadvantages of setting a lower level of concern (LOC) for the toxicants in these wastes, and of the data needed to perform the needed risk assessments, we have concluded that, with the data presently available, it is not possible to make a determination regarding such a level. The matrix variability of these wastes, ranging from still bottoms to filter aids to contaminated soils, is very great, and their specific isomeric composition is not known. It is also very difficult to judge the bioavailability of the CDDs and CDFs in these different matrices. The development of exposure and risk assessments would therefore be extremely difficult in this case, and even more suspect than is usually the case because it would entail even more assumptions than those usually made in such a procedure. Therefore, EPA has not developed a LOC for the toxicants—in particular, the CDDs and CDFs—in these wastes. EPA, however, will continue to explore this alternative as additional information becomes available.

B. Discarded Unused Formulations

This regulation designates as RCRA hazardous wastes discarded unused formulations containing tri-, tetra-, or pentachlorophenol and their derivatives (EPA Hazardous Waste No. F027), except those discarded as household wastes. In proposing the regulation, EPA solicited comment as to how generators could identify whether these formulations are subject to this regulation.

Two respondents commented on this problem. One person stated that chemical product labels should contain recommendations for disposal; another recommended that EPA coordinate with OSHA to require that OSHA Form 20 (Material Safety Data Sheet (MSDS)) be amended to require disposal information. In particular, they indicated that Section VII of the MSDS (Spill and Leak Procedures) provides space for the manufacturer's recommendations for disposal of the chemical or its waste residues. They suggest that manufacturers be required to state in this space that the product, when discarded, is a hazardous waste, list the hazardous waste number, and include a statement concerning the appropriate waste disposal method.

EPA agrees that implementation of these suggestions would go a long way toward solving the problem. If chemical products were identified on the label as an EPA hazardous waste, when discarded, there would be no need to divulge specific (and possibly proprietary) information, and users of such products would not be in doubt that the product in question, when discarded, is subject to RCRA regulation. However, EPA does not have the authority under RCRA to label products and provide disposal information. In addition, form OSHA-20 seldom accompanies a product, and therefore would not solve the problem.

However, EPA possesses authority under other statutes to deal with this problem. Under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), the Agency, under the Label Improvement Program, has sent a notice to all registrants (Notice 81–3) indicating to them that pesticide products that are RCRA hazardous wastes, when discarded, must include a statement which indicates that the pesticide (when discarded) is a hazardous or an acute hazardous waste. This requirement becomes effective on January 1, 1985 for all pesticide products except for pesticides discarded by the householder. This same label provision will be required for those pesticide products covered by today's regulation (*i.e.*, for these pesticide products, the label will indicate that they are acute hazardous wastes (EPA Hazardous Waste No. F027) when discarded. The label will not provide specific instructions as to its disposal, but rather will refer the user or any other persons who handles these specific pesticides to contact the EPA Regional Office or the State environmental office for disposal instructions. Thus, the label on all pesticidal products containing tri-, tetra-, or pentachlorophenol or their derivatives, will identify whether the formulation is hazardous, if discarded, and will provide the user with instructions on who to contact if disposal information is necessary.

C. Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Clean Up Activities

Several commenters felt that the proposed rule, while beneficial and important, is predominantly slanted toward prevention of future accidental releases of CDDs and CDFs to the environment, rather than cleanup of existing contaminated areas (*i.e.*, Times Beach, MO). The commenters expressed concern that certain portions of the proposed rules may hinder or prevent remedial action of contaminated sites. For example, incineration of soil with relatively low concentrations of TCDD could be costly to accomplish, and, since the residue of hazardous waste treatment is still a hazardous waste, there would be little incentive to incinerate contaminated soils. Also, permitting a site under RCRA could be very difficult, possibly delaying or preventing remedial action which could be conducted under CERCLA.

While we agree that the proposed rule is slanted toward prevention of future accidental releases of CDDs/CDFs to the environment, we do not agree that this rule will significantly hinder or prevent cleanup of existing contaminated sites. The major waste that is generated at these sites, as implied by the commenter, is soil contaminated with CDDs/CDFs. These soils are acute hazardous wastes, since soil contaminated with hazardous waste spills are defined as being in the RCRA system. See 48 FR 2508, January 19, 1983; see § 261.3(c)(2). Ongoing and anticipated cleanup activities have generated, and will continue to generate, large volumes of soils contaminated with CDDs/CDFs. For instance, it is conservatively estimated that about 500,000 cubic yards of CDD/CDF-contaminated soil will result from CERCLA remedial action activities in Missouri.

The Agency developed a strategy for dealing with dioxin (USEPA, 1983), which, among other things, deals with alternatives for the cleanup of contaminated sites. These alternatives include securing the soil in place, novel remediation techniques (*e.g.*, solvent extraction), incineration, and removal of soil to a secure containment system (*e.g.* a concrete vault). The Agency has indicated that remediation and enforcement measures under CERCLA will be carried out as expeditiously as possible.

In addition, we are also allowing the disposal of residues resulting from the incineration or thermal treatment of dioxin-contaminated soils at interim status land disposal facilities,[illegible] and to allow treatment, storage, or disposal at facilities pursuant to the usual Part 264 standards (*i.e.*, not meeting the special standards for other dioxin-containing wastes, such as secondary containment or a waste management plan). Although

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[illegible] Although the incineration of dioxin-contaminated soils is not practiced to any great extent, EPA plans to investigate this management option for dioxin-contaminated soils, and, in fact, has allocated considerable resources in this area.

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there are very few data on the characteristics of the residues resulting from soil incineration. data are available on the incineration of materials such as PCB capacitors and sewage treatment sludges. These data indicate that the residues resulting from such incineration contain PCBs at levels three to four orders of magnitude less than that contained in the original waste before incineration. Most dioxin-contaminated soils contain less than 1 ppm of TCDD. Thus. it is expected that the concentration of this isomer in the residue from the incineration of soils will be less than about 1 ppb. This concentration in soil was determined to be a reasonable level at which to consider limiting human exposure in a residential setting (USDHHS. 1984). We believe the same is true for the other chlorinated dioxin isomers of concern. as well as for the dibenzofurans.

Data on carbon regeneration show similar results. These data indicate that toxicants such as PCBs. that bind strongly to activated carbon or organic carbon can be effectively removed and destroyed from such matrices such that very low levels of the toxicants remain in the resulting residues. There is no reason to doubt that CDDs and CDFs (of similar incinerability) when bound to organic carbon in a soil matrix will behave any differently. We have therefore determined that the residues of incineration or thermal treatment of CDD/CDF contaminated soils. present much less risk than the untreated soils. and thus can be managed at interim status land disposal facilities.[26] We have. therefore. provided a special designation (EPA Hazardous Waste No. FO28) for these wastes.

D. Other Wastes Containing CDDs and CDFs

Several respondents commented on the need to list other wastes which contain CDDs and CDFs. *i.e.*. chlorinated benzenes and PCBs. dichlorophenol process wastes. fly ash and emission control dusts from the low-temperature combustion of chlorophenols. and presently unlisted residues from wood preservation.

The recently enacted HSWA specifically provides additional time to the Agency for evaluating whether to list additional dioxin-containing wastes. See RCRA amended Section 3001(e). As stated in the preamble to the proposed regulation (48 FR 14523). EPA is presently conducting a study on wastes from the production of dichlorophenol. Under EPA's Industry Studies program. the Office of Solid Waste (OSW) has performed engineering analyses. and has gathered sampling and analysis data from several dichlorophenol production facilities. and from facilities that use dichlorophenol. These data are presently being evaluated. In addition. under Tier 4 of the "Dioxin Strategy" (USEPA. 1983). EPA is investigating possible combustion sources of CDDs and CDFs. These materials will be listed if evidence demonstrates that they are indeed hazardous (or acute hazardous) wastes. We also have begun investigating whether additional wastes from wood preservation processes using PCP should be listed as hazardous (or acute hazardous) wastes. and whether CDDs and CDFs should be added as constituents of concern in the wood preservation process waste already listed (EPA Hazardous Waste No. K001. Bottom sediment sludge from the treatment of wastewaters from wood preserving processes that use creosote and/or pentachlorophenol). After completion of those studies. we will take regulatory action. if warranted.

With respect to wastes resulting from the manufacturing use of chlorobenzenes. such processes are not expected to generate CDDs or CDFs except under alkaline conditions and elevated temperatures. We therefore judge that these processes are adequately covered by the present listings. It is possible that commercial preparations of mono- and dichlorobenzene (which are not covered by today's listing) contain homologues with higher degree of chlorination. and thus could give rise to CDDs and CDFs at levels of concern. If further investigation proves that this is the case. we will list the wastes from such processes.

With respect to PCBs. we agree that CDDs and CDFs may well occur in processes involving these materials. However. PCBs are no longer manufactured in the U.S.. and their use and disposal are currently regulated under TSCA (40 CFR Part 761). The major problem at present is the generation of CDDs and CDFs resulting from transformer fires. The regulation of the disposal of the wastes (including soot) from such fires is presently being studied under the dioxin strategy. and EPA recently proposed a regulation intended to control the potential hazards resulting from PCB transformer fires (see 49 FR 39966–39989. October 11. 1984).

E. Wastes Containing Other Halogenerated Dioxins and Dibenzofurans

Two respondents commented that EPA should not limit its consideration to processes which are expected to generate tetra-. penta-. or hexachlorinated dioxins and -dibenzofurans. because the brominated analogues are also of great concern in terms of their potential to harm human health. and because the congeners of higher degree of chlorination can undergo dechlorination in the environment.

We agree that the brominated analogues are a potential threat. EPA has investigated whether there are at present manufacturing processes generating these toxicants. It was determined that there are at present no U.S. manufacturers of the brominated chemicals (bromophenols. bromophenoxy derivatives. brominated biphenyls) which are expected. from knowledge of chemical reaction. to be contaminated with brominated dioxins and -dibenzofurans. We are continuing to investigate. however. whether there are users (formulators) of such compounds. We are also evaluating other organobromine manufacturing processes. If warranted. we will list wastes from such manufacturing operations. and will include brominated dioxins and -dibenzofurans as toxicants of concern.

With respect to the higher chlorinated dioxins. we agree that dechlorination occurs. However. it is very difficult to predict the extent of this process. and the equilibrium composition of the various isomers. Both photochemical synthesis and degradation of CDDs and CDFs can occur under ambient conditions. The photochemical formation of OCDDs from PCP has been shown to occur. both in solution. and on PCP-treated wood (Crosby et al.. 1973: Crosby and Wong. 1978: Lamparsky. 1980). Resistance to degradation increases with degree of chlorination (Hutzinger. 1973: Crosby. 1973: Desideri. 1979: Dobbs and Grant. 1979: Nestrick. 1980). In most situations. photodegradation by reductive photodechlorination exceeds photosynthetic processes. and reaction routes and rates are dependent on reaction conditions. Rate constants show that this process is a relatively minor pathway for the destruction of the octa-, hepta-, and hexachlorodioxins, accounting for less than 10% of octachlorodioxin destruction (Dobbs and Grant, 1979). Unidentified compounds with gas chromatographic retention times longer than that of OCDD are also formed. While photodechlorination can occur rapidly in solution under laboratory conditions, it can be slow in soil, or on leaves (Crosby, 1977). Contradictory results have been obtained in the laboratory experiments on photodegradation in the adsorbed state (Crosby, 1977; Wong, 1978). When degradation does take place, however, the congeners produced are usually those of less toxic concern. Although displacement of chlorine atoms *ortho* to the oxygen atoms does occur (Buser, 1979; Crosby, 1973; Lamparski, 1980), most investigators have noted that the lateral halogen atoms are the most labile (Stehl, 1971; Dobbs and Grant, 1979; Nestrick, 1980). Therefore, the 2,3,7,8-substituted isomers are those most likely to degrade. Thus, the photodegradation of highly chlorinated CDDs and CDFs is not likely to generate the less chlorinated isomers of most toxic concern. We therefore conclude that, in view of present knowledge, the regulation of wastes containing tetra-, penta-, and hexachlorodioxins and -dibenzofurans adequately address our present regulatory concerns.

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[26] Other dioxin-containing wastes are expected to contain much higher concentrations of the dioxins and dibenzofurans. Therefore. we would expect the residue from the incineration of these wastes to also contain much higher concentrations of the dioxins and dibenzofurans. Consequently. we believe that all other incineration residues should be managed as acute hazardous wastes and comply with the special management standards. However. any person may petition the Administrator (under §§ 260.20 and 260.22) to exclude their waste from regulatory control (or at least argue that the waste should not be considered an acute hazardous waste) if they can demonstrate such facts in their petition.

F. Small Quantity Generator Comments

Several respondents commented that this regulation constitutes an excessive and unwarranted regulatory burden. One commenter stated that because of the limited disposal options small quantity generators now exempt from regulation would need to apply for status as storage facilities. One person argued that EPA must show a "sound basis" for the 1 kg/month small quantity generator limitation for these wastes.

EPA does not agree with the comments stating that this regulation represents an unreasonable burden on the regulated community. The economic impact analysis performed for this regulation (see Section IX.) determined that the costs incurred by this regulation are extremely modest (about eight million dollars per year, maximum).[22] When compared with the costs of cleaning up the mismanaged wastes (more than thirty million dollars for Times Beach, MO, alone) this modest economic burden is entirely warranted. Moreover, the economic analysis did not consider that many generators may already be covered by RCRA or TSCA regulation, and that the disposal of some of the listed formulations (those in which the listed chlorophenols or their derivatives are sole active ingredients) is already regulated under § 261.33 of RCRA. Additionally, because of their inherent value, we do not believe that the regulated community will usually discard substantial quantities of these formulations.

With respect to the comment that EPA must show a basis for the 1 kg/month small quantity generator limitation, this comment was previously discussed in Section III. B. 5. above.

G. Comments on Reuse and Recycling Issue

Several commenters stated that the provisions in the proposed regulation which would list and regulate these wastes as hazardous wastes would prohibit their reuse and recycling. This was said to be at odds with the recycling objectives of RCRA. Two commenters suggested that EPA should allow on-site recycling and reuse of the listed wastes without regulation.

Most of the comments concern issues which are part of a different rulemaking proceeding, amending the existing definition of solid waste and establishing management standards for hazardous wastes that are recycled. See 48 FR 14472, April 4, 1983 proposing these rules. Thus, we will address those comments in finalizing that rulemaking. We note, however, that nothing in this proposal or in existing rules would prohibit recycling of these wastes. Rather, these wastes would remain subject to regulation when they are to be recycled.

H. Applicability of the Mixture Rule

One commenter questioned whether, and to what extent, surface water runoff and plant sweepings would be considered hazardous waste under the mixture rule. As stated in § 261.3(c)(2), precipitation run-off is not automatically considered a hazardous waste, but plant sweepings which contain an acute hazardous waste are residues of cleanup operations, and would be considered to be acute hazardous waste, unless put to direct use as a pesticide or incorporated back into product.

I. Comments on the Analytical Method and the Background Document

Several respondents commented on the proposed analytical method for CDDs and CDFs. In general, these persons commented on specific details of the method, such as the need for sample preservation, the size of the specified extraction vessels, the suitability of the chromatographic substrates, the appropriateness of the calibration standard, and quality control procedures. Several comments were also received on the Background Document for this listing. These comments are responded to in detail in the Background Document for this listing. Where appropriate, the analytical method (see Appendix IX to Part 261 of this notice) and the Background Document have been modified.

VII. Relation of This Regulation to Those Promulgated Under CERCLA Section 102(b) (Reportable Quantities)

All hazardous wastes (or, in this case, acute hazardous wastes) included in today's final rule automatically become hazardous substances under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). (See CERCLA Section 101(14).) CERCLA requires that persons in charge of vessels or facilities from which hazardous substances have been released in quantities that are equal to or greater than the reportable quantities (RQs) immediately notify the National Response Center (NRC) of the release. (See CERCLA Section 103.) Except for those substances already on the list of CERCLA hazardous substances, which will retain the RQ already assigned, all hazardous wastes designated under RCRA will have an RQ of one pound, until adjusted by regulation under CERCLA. See Section 102.

If a waste has more than one constituent of concern, the lowest RQ assigned to any one of the constituents present in the waste represents the RQ for the waste. If a person completely analyzes the waste, however, and determines that the RQ for each of the constituents of concern are below the RQ established for each of those compounds, no notification is required. Thus, for the dioxin-containing wastes listed today, a one pound RQ shall be assigned upon promulgation of this rule, since a one pound RQ has already been specified by operation of law (CERCLA Section 102) for a number of the constituents of concern.[23] Therefore, if a person were to spill one pound of any of the wastes covered by today's rule, he would need to notify the NRC of the release, unless the person determines

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[22] This study assumed that all generators would need an RCRA storage permit.

[23] RQs have been assigned for the following constituents of concern: chlorophenols, 2,4,5-TCP, 2,4,6-TCP, 2,3,4,6-TeCP, TCDD: 1 lb and 2,4,5-T acid and its salt, amine, and ester derivatives, and Silvex and its esters: 100 lbs.

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that there is less than an RQ of each hazardous constituent in the waste.

The one pound RQ is currently the lowest level established for reporting releases of hazardous substances for emergency response reporting. The basis for this RQ level was established under the Clean Water Act (CWA) as the smallest quantity container generally shipped in commerce. Many substances on the CERCLA Section 101(14) hazardous substance list may be extremely toxic, or otherwise extremely hazardous, and, therefore, may need to be controlled at levels well below the RQ levels. For instance, the CDDs and CDFs deserve special note for their extreme toxicity.

The RQ triggers are intended to provide notice of releases so that an On-Scene Coordinator (OSC), pursuant to the National Contingency Plan (40 CFR 300), can assess the hazard and the actions that may be taken by the federal government. It is emphasized that the legal obligation for the responsible party to notify the NRC is independent of actions taken by an OSC. The different RQ levels do not reflect a determination that a release of a substance will be hazardous at the RQ level, or not hazardous below that level. EPA has not attempted to make such a determination because the actual hazard will vary with the unique circumstances of the release, and extensive scientific data and analysis would be necessary to estimate the precise hazard presented by each substance in a number of plausible circumstances. Instead, the RQs reflect EPA's judgment that the Federal government should be notified of releases to which a response might be necessary. The RQs, in themselves, do not represent any determination that releases of a particular size are actually harmful to public health or the environment. See 48 FR 23560, May 25, 1983.

Many other considerations besides the quantity released affect the government's decision concerning whether and how it should respond to a particular release. The location of the release, its proximity to drinking water supplies or other valuable resources, the likelihood of exposure or injury to nearby populations, and other factors must be assessed on a case-by-case basis. The reporting requirement is, however, the trigger for assessements to be made (see 48 FR 23560).

While the one pound RQ is clearly the smallest emergency response notification trigger at the present time for CERCLA and CWA releases, EPA can take response, cleanup, and other actions below RQ levels. The RQ is a level that legally *requires* reporting by the responsible party. There obviously may be instances where EPA would need to know of releases well below the one pound RQ level. While EPA, in future refinements to the RQ scales, may consider lower levels, *this process is independent of today's rulemaking*. The reader is also advised that notification requirements within RCRA may require notification for releases which may be harmful, regardless of RQ determinations under CERCLA or the CWA. Specifically, the responsible party may be required to provide notice to EPA or the National Response Center under RCRA regarding spills and leaks of hazardous waste or hazardous waste constituents that may enter the environment (see 40 CFR 262.34 263.30, 264.56, and 265.56). In addition, each person who generates, transports, treats, stores, or disposes of these wastes must notify EPA of their activities, and thus, EPA will be aware of those persons who handle these extremely hazardous wastes.

VIII. State Authority

A. Applicability of Rules in Authorized States

Under Section 3006 of RCRA, EPA may authorize qualified States to administer and enforce the RCRA program within their States. (See 40 CFR Part 271 for the standards and requirements for authorization.) Authorization, either interim or final, may be granted to State programs that regulate the identification, generation, and transportation of hazardous wastes and the operation of facilities that treat, store, or dispose of hazardous waste. Interim authorization is granted to States with programs that are "substantially equivalent" to the Federal program (Section 3006(c)). Final authorization is granted to States with programs that are equivalent to the Federal program, consistent with the Federal program and other State programs, and that provide for adequate enforcement (Section 3006(b)).

Under RCRA, prior to the Hazardous and Solid Waste Amendments of 1984, once EPA authorizes a State program, EPA suspends administration and enforcement within the State of those parts of the Federal program for which the State is authorized. In authorized States, EPA does retain enforcement authority under Sections 3008, 7003, and 3013 of RCRA, although authorized States have primary enforcement responsibility. However, under Section 3006(g) of the Hazardous and Solid Waste Amendments of 1984, any requirement pertaining to hazardous wastes promulgated pursuant to the Amendments is effective in authorized States at the same time it is effective in other States. EPA will administer and enforce the requirements in each State until the State is authorized with respect to such requirements.

The listing and related management standards promulgated in today's rule are applicable in all States since the requirements are imposed pursuant to the Amendments. Thus EPA will implement these standards until authorized States revise their programs to adopt these rules.

B. Effect on State Authorizations

Under RCRA, authorized State programs must be revised to incorporate new requirements imposed by statute or EPA regulations. The procedures and schedule for State adoption of these requirements is described in 40 CFR 271.21. See 49 FR 21678 (May 22, 1984).

States that have final authorization must revise their programs within a year of promulgation of today's regulations if only regulatory changes are necessary. These deadlines can be extended in exceptional cases. See 40 CFR 271.21(e).

States that submit official applications for final authorization less than 12 months after promulgation of today's regulations may be approved without including standards equivalent to those promulgated. However, once authorized, a State must revise its program to include the listing and related management standards substantially equivalent or equivalent to EPA's within the time period discussed above.

Under the HSWA, states revising their programs to adopt new requirements imposed under the HSWA may do so based on state requirements that are equivalent or substantially equivalent to the HSWA requirements. See Section 3006(g)(2). Thus a state seeking authorization for today's amendments may do so based on controls that are equivalent or substantially equivalent to today's rule.

IX. Economic, Environmental, and Regulatory Impacts

A. Regulatory Impact Analysis

Under Executive Order 12291, EPA must determine whether a regulation is "major", and therefore subject to the requirement of a Regulatory Impact Analysis. These amendments, in part, replace regulations under a different statute (Section 6(d) of the Toxic Substance Control Act), and impose an additional regulatory burden on only a small number of manufacturers of chlorophenols, and their chlorophenoxy derivatives. In addition, some

JRB Associates. 1984. Cost impact analysis for the proposed rule regulating certain wastes containing certain chlorinated dioxins, -dibenzofurans, and -phenols. April.

Kimbrough, R.D. et al. 1983. Risk Assessment document on 2, 3, 7, 8-Tetrachlorodibenzodioxin (TCDD) levels in soil. USDHHS/CDC/NIEHS. December.

Lamparski, L.L. et al. 1980. Photolysis of pentachlorophenol-treated wood: chlorinated dibenzo-p-dioxin formation. *Env. Sci. Technol.* 14:196–201.

McGaughy, R. (ORD). 1984. Memorandum to A. Rispin (OPP) on carcinogenic potency estimate for HxCDDs. April 19.

Miles, W.F., et al. 1984. Isomer specific determination of hexachlorodioxins in technical pentachlorophenol (PCP) and its sodium salt. *4th. Internl. Symp. Chld. Dioxins and Rald. Cpds.* Ottawa, Oct. 16–19.

MRI. 1983. Determination of the destruction of PCBs at SCA Chemical Services Inc. Chicago incinerator. Final Report. Part I. Technical Summary. MRI Project Number 7302G. January 22.

National Academy of Sciences. 1977. Drinking water and health. National Academy of Sciences. Washington, D.C.

Nestrick, T.J. et al. 1980. Indentification of tetrachlorodibenzo-p-dioxin isomers at the 1 ng level by photolytic degradation and pattern recognition techniques. *Anal. Chem.* 52:1865–1874.

Plimmer, J.R. and U.I. Klingbiel. 1971. Riboflavin photosensitized oxidation of 2, 4-dichlorophenol: assessment of possible chlorinated dioxin formation. *Science* 174:404–408.

Plimmer, J.R. et al. 1973. Photochemistry of dibenzo-p-dioxins. *Adv. Chem.* 120:44–54.

Poiger, M. and C. Schlatter. 1980. Influence of solvents and absorbance on dermal and intestinal absorption of TCDD. *Fd. Cosmet. Toxicol.* 18:477–481.

Ris, C. (EPA/ORD). 1983. Memorandum to J.S. Bellin (EPA/OSW), memorandum on 1981 Hawaii epidemiology study. September 16.

Sambeth, J. 1983. The Seveso accident. *Chemosphere* 12:[illegible]

Schwetz, B.A. et al. 1978. Results of two-year toxicity and reproduction studies on pentachlorophenol in rats. *In:* Pentachlorophenol, chemistry, pharmacology, and environmental toxicology (K.R. Rao, ed.). Plenum Press, N.Y.

Squire, R.A. 1983. An assessment of the experimental evidence for potential carcinogenicity of hexachlorodibenzo-*p*-dioxin. June 28.

Stehl, R. et al. 1971. The stability of pentachlorophenol and chlorinated dioxins to sunlight, heat and combustion. *162nd annual meeting: Amer. Chem. Soc.* Sept. (Abstract 92).

USDHHS. 1980. *Bioassay of a mixture of 1,2,3,6,7,8- and 1,2,3,7,8,9-* hexachlorodibenzo-*p*-dioxins for possible carcinogenicty. 1980. NTP. No. 80–12.

USDDHS. 1984. Health risk estimates for 2, 3, 7, 8-tetrachloro-dibenzodiozin in soil: *Morbility and mortality weekly report* 33:25–8.

USEPA. 1978. Report of the Ad Hoc Study group for pentachlorophenol contaminants. Environmental health advisory committee. Science Advisory Board. December. (EPA/SAB/78/002).

USEPA. 1981a. Creosote, inorganic arsenicals, pentachlorophenol. Position Document No. 2/3. Office of Pesticides and Toxic Substances. January.

USEPA. 1981b. Interim evaluations of health risks associated with emissions of tetrachlorinated dioxins from municipal waste resource recovery facilities. Office of the Administrator. (November 19).

USEPA. 1981c. Incineration of PCBs: Summary of Approval Actions: Energy Systems Company (ENSCO), El Dorado, AR. EPA Region 6. February 6, 1981.

USEPA. 1981d. Incineration of PCBs: Summary of Approval Actions: Rollins Environmental Services. Deer Park, TX. EPA Region 6. February 6, 1981.

USEPA. 1982. Development Document for Effluent Limitations Guidelines and Standards for the Pesticides. EPA 440/1–82–079b. (Proposed).

USEPA. 1983. Dioxin strategy. OWRS: OSWER. November 28. Wipf, H.K. et al. 1978. Field trials on photodegradation of TCDD on vegetables after spraying with vegetable oil. *In:* Dioxins: toxicological and chemical aspects. *Op. Cit.*

USEPA. 1984. Project for performance of remedial response activities at uncontrolled hazardous substance facilities, zone 1. Analytical results from Brady Metals, Newark, N.J. EPA Region 2. NUS Corporation. March 21 (final draft).

USEPA. 1984b. Ambient Water Quality Criteria for 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin. EPA 440/5–84–007.

Williams, P.L. 1982. Pentachlorophenol, an assessment of the occupational hazard. *Am. Ind. Hyg. Assoc. J.* 43:799–810.

Wong, A.S. and D.G Crosby. 1978a. Decontamination of 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDDs) by photochemical action. *In:* Dioxins: toxicological and chemical aspects. *Op. Cit.*

Wong, A.S. and D.G. Crosby (1978b). Photolysis of Pentachlorophenol in Water. *Environ. Sci. Res.* 12:19–25.

XI. List of Subjects

40 CFR Part 261

Hazardous materials, Waste treatment and disposal, Recycling.

40 CFR Part 264

Hazardous materials, Packaging and containers, Reporting and recordkeeping requirements, Security measures, Security bonds, Waste treatment and disposal.

40 CFR Part 265

Hazardous materials, Packaging and containers, Reporting and recordkeeping requirements, Security measures, Security bonds, Waste treatment and disposal, Water supply.

40 CFR Part 270

Administrative practice and procedure, Reporting and recordkeeping requirements, Hazardous materials, Waste treatment and disposal, Water pollution control, Water supply, Confidential business information.

40 CFR Part 775

Environmental protection, Hazardous materials, Pesticides and pests, Waste treatment and disposal.

Dated: December 20, 1984.

Alvin L. Alm,

Acting Administrator.

For the reasons set out in the preamble, Title 40 of the Code of Federal Regulations is amended to read as follows:

PART 261—IDENTIFICATION AND LISTING OF HAZARDOUS WASTE

1. The authority citation for Part 261 reads as follows:

Authority: Secs. 1006, 2002(a), 3001, and 3002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1976, as amended (42 U.S.C. 6905, 6912(a), 6921, and 6922).

2. In § 261.5, paragraphs (e)(1) and (e)(2) are revised to read as follows:

§ 261.5 Special requirements for hazardous waste generated by small quantity generators.

* * * * *

(e) * * *

(1) A total of one kilogram of acute hazardous wastes listed in §§ 261.31, 261.32, or 261.33(e).

(2) A total of 100 kilograms of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of any acute hazardous wastes listed in §§ 261.31, 261.32, or 261.33(e).

* * * * *

3. In § 261.7, the introductory text of paragraphs (b)(1) and (b)(3) are revised to read as follows:

§ 261.7 Residues of hazardous waste in empty containers.

* * * * *

(b)(1) A container or an inner liner removed from a container that has held any hazardous waste, except a waste that is a compressed gas or that is identified as an acute hazardous waste listed in §§ 261.31, 261.32, or 261.33(e) of this chapter is empty if:

* * * * *

(3) A container or an inner liner removed from a container that has held an acute hazardous waste listed in §§ 261.31, 261.32, or 261.33(e) is empty if:

* * * * *

4. In § 261.30, paragraph (d) is revised to read as follows:

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§ 261.30 General.

* * * * *

(d) The following hazardous wastes listed in § 261.31 or § 261.32 are subject to the exclusion limits for acutely hazardous wastes established in § 261.5: EPA Hazardous Wastes Nos. FO20, FO21, FO22, FO23, FO26, and FO27.

* * * * *

5. In § 261.31, add the following waste streams:

§ 261.31 Hazardous waste from nonspecific sources.

Industry	EPA hazardous waste No.	Hazardous waste	Hazard code
		* * * * * * *	
Generic	FO20	Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production or manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tri- or tetrachlorophenol, or of intermediates used to produce their pesticide derivatives. (This listing does not include wastes from the production of Hexachlorophene from highly purified 2,4,5-trichlorophenol.).	(H).
	FO21	Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production or manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of pentachlorophenol, or of intermediates used to produce its derivatives.	(H).
	FO22	Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tetra-, penta-, or hexachlorobenzenes under alkaline conditions.	(H).
	FO23	Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production of materials on equipment previously used for the production or manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tri- and tetrachlorophenols. (This listing does not include wastes from equipment used only for the production or use of Hexachlorophene from highly purified 2,4,5-trichlorophenol.).	(H).
	FO26	Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production of materials on equipment previously used for the manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tetra-, penta-, or hexachlorobenzene under alkaline conditions.	(H).
	FO27	Discarded unused formulations containing tri-, tetra-, or pentachlorophenol or discarded unused formulations containing compounds derived from these chlorophenols. (This listing does not include formulations containing Hexachlorophene synthesized from prepurified 2,4,5-trichlorophenol as the sole component.).	(H).
	FO28	Residues resulting from the incineration or thermal treatment of soil contaminated with EPA Hazardous Waste Nos. FO20, FO21, FO22, FO23, FO26, and FO27.	(T).
		* * * * * * *	

6. § 261.33(*f*) is amended by revising the hazardous waste numbers for the following substances:

§ 261.33 Discarded commercial chemical product, off-specification species, container residues, and spill residues thereof.

* * * * *

(*f*) * * *

Hazardous waste No.	Substance
* * *	* *
See FO27	Pentachlorophenol.
* * *	* *
See FO27	Phenol, pentachloro-.
Do	Phenol, 2,3,4,6-tetrachloro-.
Do	Phenol, 2,4,5-trichloro-.
Do	Phenol, 2,4,6-trichloro-.
* * *	* *
See FO27	Propanoic acid, 2-(2,4,5-trichlorophenoxy)-.
* * *	* *
See FO27	Silvex.
* * *	* *
See FO27	2,4,5-T.
* * *	* *
See FO27	2,3,4,6-Tetrachlorophenol.
* * *	* *
See FO27	2,4,5-Trichlorophenol.
Do	2,4,6-Trichlorophenol.
Do	2,4,5-Trichlorophenoxyacetic acid.
* * *	* *

7. Amend Table 1 in Appendix III of Part 261, by removing the entry "chlorinated dibenzodioxins", and adding the following entries in alphabetical order:

Appendix III—Chemical Analysis Test Methods

TABLE 1.—ANALYTICAL METHODS FOR ORGANIC CHEMICALS CONTAINED IN SW-846

Compound	First edition method(s)	Second edition method(s)
* * * * *		
Chlorinated dibenzo-p-dioxins		8280
Chlorinated dibenzofurans		8280
* * * * *		

8. Amend Table 3 in Appendix III of Part 261, by adding the following entry under Organic Analytical Methods—Gas Chromatographic/Mass Spectroscopy Methods (GC/MS) after the entry entitled "GC/MS Semi-Volatiles, Capillary:

TABLE 3.—SAMPLING AND ANALYSIS METHODS CONTAINED IN SW-846

Title	First edition		Second edition	
	Section No.	Method No.	Section No.	Method No.
* * * * *				
Analysis of Chlorinated Dioxins and Dibenzofurans			8.2	8280
* * * * *				

9. Add the following entries in numerical order to Appendix VII of Part 261:

Appendix VII—Basis for Listing Hazardous Wastes

EPA hazardous waste No.	Hazardous constituents for which listed
* * *	* *
FO20	Tetra- and pentachlorodibenzo-p-dioxins; tetra and pentachlorodibenzofurans; tri- and tetrachlorophenols and their chlorophenoxy derivative acids, esters, ethers, amine and other salts.
FO21	Penta- and hexachlorodibenzo-p-dioxins; penta- and hexachlorodibenzofurans; pentachlorophenol and its derivatives.
FO22	Tetra-, penta-, and hexachlorodibenzo-p-dioxins; tetra-, penta-, and hexachlorodibenzofurans.
FO23	Tetra-, and pentachlorodibenzo-p-dioxins; tetra- and pentachlorodibenzofurans; tri- and tetrachlorophenols and their chlorophenoxy derivative acids, esters, ethers, amine and other salts.
FO26	Tetra-, penta-, and hexachlorodibenzo-p-dioxins; tetra-, penta-, and hexachlorodibenzofurans.
FO27	Tetra-, penta-, and hexachlorodibenzo-p-dioxins; tetra-, penta-, and hexachlorodibenzofurans; tri-, tetra-, and pentachlorophenols and their chlorophenoxy derivative acids, esters, ethers, amine and other salts.
FO28	Tetra-, penta-, and hexachlorodibenzo-p-dioxins; tetra-, penta-, and hexachlorodibenzofurans; tri-, tetra-, and pentachlorophenols and their chlorophenoxy derivative acids, esters, ethers, amine and other salts.
* * *	* *

10. Add the following constituents in alphabetical order to Appendix VIII of Part 261:

Appendix VIII—Hazardous Constituents

* * * * *

hexachlorodibenzo-*p*-dioxins
hexachlorodibenzofurans
pentachlorodibenzo-*p*-dioxins
pentachlorodibenzofurans

tetrachlorodibenzo-*p*-dioxins
tetrachlorodibenzofurans

* * * * *

11. Appendix X is added to Part 261 to read as follows:

Appendix X—Method of Analysis for Chlorinated dibenzo-p-dioxins and dibenzofurans [1, 2, 3, 4]

Method 8280

1. *Scope and Application*

1.1 This method measures the concentration of chlorinated dibenzo-*p*-dioxins and chlorinated dibenzofurans in chemical wastes including still bottoms, filter aids, sludges, spent carbon, and reactor residues, and in soils.

1.2 The sensitivity of this method is dependent upon the level of interferences.

1.3 This method is recommended for use only by analysts experienced with residue analysis and skilled in mass spectral analytical techniques.

1.4 Because of the extreme toxicity of these compounds, the analyst must take necessary precautions to prevent exposure to himself, or to others, of materials known or believed to contain CDDs or CDFs.

2. *Summary of the Method*

2.1 This method is an analytical extraction cleanup procedure, and capillary column gas chromatograph-low resolution mass spectrometry method, using capillary column GC/MS conditions and internal standard techniques, which allow for the measurement of PCDDs and PCDFs in the extract.

2.2 If interferences are encountered, the method provides selected general purpose cleanup procedures to aid the analyst in their elimination.

3. *Interferences*

3.1 Solvents, reagents, glassware, and other sample processing hardware may yield discrete artifacts and/or elevated baselines causing misinterpretation of gas chromatograms. All of these materials must be demonstrated to be free from interferences under the conditions of the analysis by running method blanks. Specific selection of reagents and purification of solvents by distillation in all-glass systems may be required.

3.2 Interferences co-extracted from the samples will vary considerably from source to source, depending upon the diversity of the industry being sampled. PCDD is often associated with other interfering chlorinated compounds such as PCB's which may be at concentrations several orders of magnitude higher than that of PCDD. While general cleanup techniques are provided as part of this method, unique samples may require additional cleanup approaches to achieve the sensitivity stated in Table 1.

3.3 The other isomers of tetrachlorodibenzo-*p*-dioxin may interfere with the measurement of 2,3,7,8–TCDD. Capillary column gas chromatography is required to resolve those isomers that yield virtually identical mass fragmentation patterns.

4. *Apparatus and Materials*

4.1. Sampling equipment for discrete or composite sampling.

4.1.1 Grab sample bottle—amber glass, 1-liter or 1-quart volume. French or Boston Round design is recommended. The container must be washed and solvent rinsed before use to minimize interferences.

4.1.2. Bottle caps—threaded to screw on to the sample bottles. Caps must be lined with Teflon. Solvent washed foil, used with the shiny side towards the sample, may be substituted for the Teflon if sample is not corrosive.

4.1.3. Compositing equipment—automatic or manual composing system. No tygon or rubber tubing may be used, and the system must incorporate glass sample containers for the collection of a minimum of 250 ml. Sample containers must be kept refrigerated after sampling.

4.2 Water bath—heated, with concentric ring cover, capable of temperature control (±2 °C). The bath should be used in a hood.

4.3 Gas chromatograph/mass spectrometer data system.

4.3.1 Gas chromatograph: An analytical system with a temperature-programmable gas chromatograph and all required accessories including syringes, analytical columns, and gases.

4.3.2 Column: SP–2250 coated on a 30 m long × 0.25 mm I.D. glass column (Supelco No. 2-3714 or equivalent). Glass capillary column conditions: Helium carrier gas at 30 cm/sec linear velocity run splitless. Column temperature is 210 °C.

4.3.3 Mass spectrometer: Capable of scanning from 35 to 450 amu every 1 sec or less, utilizing 70 volts (nominal) electron energy in the electron impact ionization mode and producing a mass spectrum which meets all the criteria in Table 2 when 50 ng of decafluorotriphenyl-phosphine (DFTPP) is injected through the GC inlet. The system must also be capable of selected ion monitoring (SIM) for at least 4 ions simultaneously, with a cycle time of 1 sec or less. Minimum integration time for SIM is 100 ms. Selected ion monitoring is verified by injecting .015 ng of TCDD Cl^{37} to give a minimum signal to noise ratio of 5 to 1 at mass 328.

4.3.4 GC/MS interface: Any GC-to-MS interface that gives acceptable calibration points at 50 ng per injection for each compound of interest and achieves acceptable tuning performance criteria (see Sections 6.1–6.3) may be used. GC-to-MS interfaces constructed of all glass or glass-lined materials are recommended. Glass can be deactivated by silanizing with dichlorodimethylsilane. The interface must be capable of transporting at least 10 ng of the components of interest from the GC to the MS.

4.3.5 Data system: A computer system must be interfaced to the mass spectrometer. The system must allow the continuous acquisition and storage on machine-readable media of all mass spectra obtained throughout the duration of the chromatographic program. The computer must have software that can search any GC/MS data file for ions of a specific mass and that can plot such ion abundances versus time or scan number. This type of plot is defined as an Extracted Ion Current Profile (EICP). Software must also be able to integrate the abundance, in any EICP, between specified time or scan number limits.

4.4 Pipettes-Disposable, Pasteur, 150 mm long × 5 mm ID (Fisher Scientific Co., No. 13–678–6A or equivalent).

4.5 Flint glass bottle (Teflon-lined screw cap).

4.6 Reacti-vial (silanized) (Pierce Chemical Co.).

5. *Reagents*

5.1 Potassium hydroxide-(ACS), 2% in distilled water.

5.2 Sulfuric acid-(ACS), concentrated.

5.3 Methylene chloride, hexane, benzene, petroleum ether, methanol, tetradecane-pesticide quality or equivalent.

5.4 Prepare stock standard solutions of TCDD and ^{37}Cl–TCDD (molecular weight 328) in a glove box. The stock solutions are stored in a glovebox, and checked frequently for signs of degradation or evaporation, especially just prior to the preparation of working standards.

5.5 Alumina-basic, Woelm; 80/200 mesh. Before use activate overnight at 600°C, cool to room temperature in a dessicator.

5.6 Prepurified nitrogen gas

6.0 *Calibration*

6.1 Before using any cleanup procedure, the analyst must process a series of calibration standards through the procedure to validate elution patterns and the absence of interferences from reagents.

6.2 Prepare GC/MS calibration standards for the internal standard technique that will allow for measurement of relative response factors of at least three CDD/^{37}CDD ratios. Thus, for TCDDs, at least three TCDD/^{37}Cl–TCDD and TCDF/^{37}Cl–TCDF must be determined.[5] The ^{37}Cl–TCDD/F *concentration*

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[1] This method is appropriate for the analysis of tetra-, penta-, and hexachlorinated dibenzo-*p*-dioxins and -dibenzofurans.

[2] Analytical protocol for determination of TCDDs in phenolic chemical wastes and soil samples obtained from the proximity of chemical dumps. T.O. Tiernan and M. Taylor. Brehm Laboratory, Wright State University, Dayton, OH 45435.

[3] Analytical protocol for determination of chlorinated dibenzo-*p*-dioxins and chlorinated dibenzofurans in river water. T.O. Tiernan and M. Taylor. Brehm Laboratory, Wright State University, Dayton, OH 45435.

[4] In general, the techniques that should be used to handle these materials are those which are followed for radioactive or infectious laboratory materials. Assistance in evaluating laboratory practices may be obtained from industrial hygienists and persons specializing in safe laboratory practices. Typical infectious waste incinerators are probably not satisfactory devices for disposal of materials highly contaminated with CDDs or CDFs. Safety instructions are outlined in EPA Test Method 613(4.0)

See also: 1) "Program for monitoring potential contamination in the laboratory following the handling and analyses of chlorinated dibenzo-*p*-dioxins and dibenzofurans" by F. D. Hileman et al., *In:* Human and Environmental Risks of Chlorinated Dioxins and *Related Compounds. R.E. Tucker*, et al. eds., Plenum Publishing Corp., 1983. 2) Safety procedures outlined in EPA Method 613, Federal Register volume 44, No. 233, December 3, 1979.

[5] ^{37}Cl-labelled 2,3,7,8–TCDD and 2,3,7,8–TCDF are available from K.O.R. Isotopes, and Cambridge

Continued

in the standard should be fixed and selected to yield a reproducible response at the most sensitive setting of the mass spectrometer. Response factors for PCDD and HxCDD may be determined by measuring the response of the tetrachloro-labelled compounds relative to that of the unlabelled 1,2,3,4- or 2,3,7,8-TCDD, 1,2,3,4,7-PCDD or 1,2,3,4,7,8-HxCDD, which are commercially available.[6]

6.3 Assemble the necessary GC/MS apparatus and establish operating parameters equivalent to those indicated in Section 11.1 of this method. Calibrate the GC/MS system according to Eichelberger, et al. (1975) by the use of decafluorotriphenyl phosphine (DFTPP). By injecting calibration standards, establish the response factors for CDDs vs. ^{37}Cl–TCDD, and for CDFs vs. ^{37}Cl–TCDF. The detection limit provided in Table 1 should be verified by injecting .015 ng of ^{37}Cl–TCDD which should give a minimum signal to noise ratio of 5 to 1 at mass 328.

7. Quality Control

7.1 Before processing any samples, the analyst should demonstrate through the analysis of a distilled water method blank, that all glassware and reagents are interference-free. Each time a set of samples is extracted, or there is a change in reagents, a method blank should be processed as a safeguard against laboratory contamination.

7.2 Standard quality assurance practices must be used with this method. Field replicates must be collected to measure the precision of the sampling technique. Laboratory replicates must be analyzed to establish the precision of the analysis. Fortified samples must be analyzed to establish the accuracy of the analysis.

8. Sample Collection, Preservation, and Handling

8.1 Grab and composite samples must be collected in glass containers. Conventional sampling practices should be followed, except that the bottle must not be prewashed with sample before collection. Composite samples should be collected in glass containers in accordance with the requirements of the RCRA program. Sampling equipment must be free of tygon and other potential sources of contamination.

8.2 The samples must be iced or refrigerated from the time of collection until extraction. Chemical preservatives should not be used in the field unless more than 24 hours will elapse before delivery to the laboratory. If an aqueous sample is taken and the sample will not be extracted within 48 hours of collection, the sample should be adjusted to a pH range of 6.0–8.0 with sodium hydroxide or sulfuric acid.

8.3 All samples must be extracted within 7 days and completely analyzed within 30 days of collection.

9. Extraction and Cleanup Procedures

9.1 Use an aliquot of 1–10 g sample of the chemical waste or soil to be analyzed. Soils should be dried using a stream of prepurified nitrogen and pulverized in a ball-mill or similar device. Perform this operation in a clear area with proper hood space. Transfer the sample to a tared 125 ml flint glass bottle (Teflon-lined screw cap) and determine the weight of the sample. Add an appropriate quantity of ^{37}Cl-labelled 2,3,7,8–TCDD (adjust the quantity according to the required minimum detectable concentration), which is employed as an internal standard.

9.2 Extraction

9.2.1 Extract chemical waste samples by adding 10 ml methanol, 40 ml petroleum ether, 50 ml doubly distilled water, and then shaking the mixture for 2 minutes. Tars should be completely dissolved in any of the recommended neat solvents. Activated carbon samples must be extracted with benzene using method 3540 in SW–846 (Test Methods for Evaluating Solid Waste—Physical/Chemical Methods, available from G.P.O. Stock #055–022–81001–2). Quantitatively transfer the organic extract or dissolved sample to a clean 250 ml flint glass bottle (Teflon lined screw cap), add 50 ml doubly distilled water and shake for 2 minutes. Discard the aqueous layer and proceed with Step 9.3.

9.2.2 Extract soil samples by adding 40 ml of petroleum ether to the sample, and then shaking for 20 minutes. Quantitatively transfer the organic extract to a clean 250 ml flint glass bottle (Teflon-lined screw cap), add 50 ml doubly distilled water and shake for 2 minutes. Discard the aqueous layer and proceed with Step 9.3.

9.3 Wash the organic layer with 50 ml of 20% aqueous potassium hydroxide by shaking for 10 minutes and then remove and discard the aqueous layer.

9.4 Wash the organic layer with 50 ml of doubly distilled water by shaking for 2 minutes, and discard the aqueous layer.

9.5 Cautiously add 50 ml concentrated sulfuric acid and shake for 10 minutes. Allow the mixture to stand until layers separate (approximately 10 minutes), and remove and discard the acid layer. Repeat acid washing until no color is visible in the acid layer.

9.6 Add 50 ml of doubly distilled water to the organic extract and shake for 2 minutes. Remove and discard the aqueous layer and dry the organic layer by adding 10g of anhydrous sodium sulfate.

9.7 Concentrate the extract to incipient dryness by heating in a 55° C water bath and simultaneously flowing a stream of prepurified nitrogen over the extract. Quantitatively transfer the residue to an alumina microcolumn fabricated as follows:

9.7.1 Cut off the top section of a 10 ml disposable Pyrex pipette at the 4.0 ml mark and insert a plug of silanized glass wool into the tip of the lower portion of the pipette.

9.7.2 Add 2.8g of Woelm basic alumina (previously activated at 600° C overnight and then cooled to room temperature in a desiccator just prior to use).

9.7.3 Transfer sample extract with a small volume of methylene chloride.

9.8 Elute the microcolumn with 10 ml of 3% methylene chloride-in-hexane followed by 15 ml of 20% methylene chloride-in-hexane and discard these effluents. Elute the column with 15 ml of 50% methylene chloride-in-hexane and concentrate this effluent (55° C water bath, stream of prepurified nitrogen) to about 0.3–0.5 ml.

9.9 Quantitatively transfer the residue (using methylene chloride to rinse the container) to a silanized Reacti-Vial (Pierce Chemical Co.). Evaporate, using a stream of prepurified nitrogen, almost to dryness, rinse the walls of the vessel with approximately 0.5 ml methylene chloride, evaporate just to dryness, and tightly cap the vial. Store the vial at 5° C until analysis, at which time the sample is reconstituted by the addition of tridecane.

9.10 Approximately 1 hour before GC–MS (HRGC–LRMS) analyses, dilute the residue in the micro-reaction vessel with an appropriate quantity of tridecane. Gently swirl the tridecane on the lower portion of the vessel to ensure dissolution of the CDDs and CDFs. Analyze a sample by GC/EC to provide insight into the complexity of the problem, and to determine the manner in which the mass spectrometer should be used. Inject an appropriate aliquot of the sample into the GC–MS instrument, using a syringe.

9.11 If, upon preliminary GC–MS analysis, the sample appears to contain interfering substances which obscure the analyses for CDDs and CDFs, high performance liquid chromatographic (HPLC) cleanup of the extract is accomplished, prior to further GC–MS analysis.

10. HPLC Cleanup Procedure[7]

10.1 Place approximately 2 ml of hexane in a 50 ml flint glass sample bottle fitted with a Teflon-lined cap.

10.2 At the appropriate retention time, position sample bottle to collect the required fraction.

10.3 Add 2 ml of 5% (w/v) sodium carbonate to the sample fraction collected and shake for one minute.

10.4 Quantitatively remove the hexane layer (top layer) and transfer to a micro-reaction vessel.

10.5 Concentrate the fraction to dryness and retain for further analysis.

11. GC/MS Analysis

11.1 The following column conditions are recommended: Glass capillary column conditions: SP–2250 coated on a 30 m long x 0.25 mm I.D. glass column (Supelco No. 2–3714, or equivalent) with helium carrier gas at 30 cm/sec linear velocity, run splitless. Column temperature is 210° C. Under these conditions the retention time for TCDDs is about 8.5 minutes. Calibrate the system daily with, a minimum, three injections of standard mixtures.

11.2 Calculate response factors for standards relative to ^{37}Cl-TCDD/F (see Section 12).

11.3 Analyze samples with selected ion monitoring of at least two ions from Table 3.

Isotopes, Inc., Cambridge, MA. Proper standardization requires the use of a specific labelled isomer for each congener to be determined. However, the only labelled isomers readily available are ^{37}Cl–2,3,7,8–TCDD and ^{37}Cl–2,3,7,8–TCDF. This method therefore uses these isomers as surrogates for the CDDs and CDFs. When other labelled CDDs and CDFs are available, their use will be required.

[6] This procedure is adopted because standards are not available for most of the CDDs and CDFs, and assumes that all the congeners will show the same response as the unlabelled congener used as a standard. Although this assumption may not be true in all cases, the error will be small.

[7] For cleanup see also method #8320 or #8330, SW–846, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (1982).

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Proof of the presence of CDD or CDF exists if the following conditions are met:

11.3.1 The retention time of the peak in the sample must match that in the standard, within the performance specifications of the analytical system.

11.3.2 The ratio of ions must agree within 10% with that of the standard.

11.3.3 The retention time of the peak maximum for the ions of interest must exactly match that of the peak.

11.4 Quantitate the CDD and CDF peaks from the response relative to the ^{37}Cl-TCDD/F internal standards. Recovery of the internal standard should be greater than 50 percent.

11.5 If a response is obtained for the appropriate set of ions, but is outside the expected ratio, a co-eluting impurity may be suspected. In this case, another set of ions characteristic of the CDD/CDF molecules should be analyzed. For TCDD a good choice of ions is m/e 257 and m/e 259. For TCDF a good choice of ions is m/e 241 and 243. These ions are useful in characterizing the molecular structure to TCDD or TCDF. For analysis of TCDD good analytical technique would require using all four ions, m/e 257, 320, 322, and 328, to verify detection and signal to noise ratio of 5 to 1. Suspected impurities such as DDE, DDD, or PCB residues can be confirmed by checking for their major fragments. These materials can be removed by the cleanup columns. Failure to meet criteria should be explained in the report, or the sample reanalyzed.

11.6 If broad background interference restricts the sensitivity of the GC/MS analysis, the analyst should employ cleanup procedures and reanalyze by GC/MS. See section 10.0.

11.7 In those circumstances where these procedures do not yield a definitive conclusion, the use of high resolution mass spectrometry is suggested.

12. *Calculations*

12.1 Determine the concentration of individual compounds according to the formula:

$$\text{Concentration, } \mu g/gm = \frac{A \times A_s}{G \times A_{is} \times R_f}$$

where:

A = µg of internal standard added to the sample[8]
G = gm of sample extracted
A_s = area of characteristic ion of the compound being quantified.
A_{is} = area of characteristic ion of the internal standard
R_f = response factor[9]

Response factors are calculated using data obtained from the analysis of standards according to the formula:

$$RI = \frac{A_s \times C_{is}}{A_{is} \times C_s}$$

where:

C_{is} = concentration of the internal standard
C_s = concentration of the standard compound

12.2 Report results in micrograms per gram without correction for recovery data. When duplicate and spiked samples are analyzed, all data obtained should be reported.

12.3 Accuracy and Precision. No data are available at this time.

TABLE 1.—GAS CHROMATOGRAPHY OF TCDD

Column	Retention time (min.)	Detection limit (µg/kg)[1]
Glass capillary	9.5	0.003

[1] Detection limit for liquid samples is 0.003 µg/l. This is calculated from the minimum detectable GC response being equal to five times the GC background noise assuming a 1 ml effective final volume of the 1 liter sample extract, and a GC injection of 5 microliters. Detection levels apply to both electron capture and GC/MS detection. For further details see 44 FR 69526 (December 3, 1979).

TABLE 2.—DFTPP KEY IONS AND ION ABUNDANCE CRITERIA[1]

Mass	Ion abundance criteria
51	30–60% of mass 198.
68	Less than 2% of mass 69.
70	Less than 2% of mass 69.
127	40–60% of mass 198.
197	Less than 1% of mass 198.
198	Base peak, 100% relative abundance.
199	5–9% of mass 198.
275	10–30% of mass 198.
365	Greater than 1% of mass 198.
441	Present but less than mass 443.
442	Greater than 40% of mass 198.
443	17–23% of mass 442.

[1] J. W. Eichelberger, L.E. Harris, and W.L. Budde. 1975. Reference compound to calibrate ion abundance measurement in gas chromatography-mass spectrometry. Analytical Chemistry 47:995.

TABLE 3.—LIST OF ACCURATE MASSES MONITORED USING GC SELECTED-ION MONITORING, LOW RESOLUTION, MASS SPECTROMETRY FOR SIMULTANEOUS DETERMINATION OF TETRA-, PENTA-, AND HEXACHLORINATED DIBENZO-*p*-DIOXINS AND DIBENZOFURANS

Class of chlorinated dibenzodioxin or dibenzofuran	Number of chlorine substituents (x)	Monitored m/z for dibenzodioxins $C_{12}H_{8-x}O_2Cl_x$	Monitored m/z for dibenzofurans $C_{12}H_{8-x}OCl_x$	Approximate theoretical ratio expected on basis of isotopic abundance
Tetra	4	[1] 319.897	[1] 303.902	0.74
		321.894	305.903	1.00
		[2] 327.885	[2] 311.894	
		[3] 256.933		0.21
		[3] 258.930		0.20
Penta	5	[1] 353.858	[1] 337.953	0.57
		355.855	339.860	1.00
Hexa	6	389.816	373.821	1.00
		391.813	375.818	0.87

[1] Molecular ion peak.
[2] Cl_{37}—labelled standard peaks.
[3] Ions which can be monitored in TCDD analyses for confirmation purposes.

PART 264—STANDARDS FOR OWNERS AND OPERATORS OF HAZARDOUS WASTE TREATMENT, STORAGE, AND DISPOSAL FACILITIES

12. The authority citation for Part 264 reads as follows:

Authority: Secs. 1006, 2002(a), 3004, and 3005 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1976, as amended (42 U.S.C. 6905, 6912(a), 6924, and 6925).

13. In Subpart I of Part 264, the introductory text in paragraph (c) is revised and a new paragraph (d) is added to § 264.175:

§ 264.175 Containment.

* * * * *

(c) Storage areas that store containers holding only wastes that do not contain free liquids need not have a containment system defined by paragraph (b) of this section, except as provided by paragraph (d) of this section or provided that:

* * * * *

(d) Storage areas that store containers holding the wastes listed below that do not contain free liquids must have a containment system defined by paragraph (b) of this section:

(1) FO20, FO21, FO22, FO23, FO26, and FO27.

(2) [Reserved]

14. In Subpart J of Part 264, amend § 264.194 by redesignating paragraph (c) as paragraph (c)(1), and adding a new paragraph (c)(2):

§ 264.194 Inspections.

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[8] The proper amount of standard to be used is determined from the calibration curve (See Section 6.0).

[9] If standards for PCDDs/Fs and HxCDDs/Fs are not available, response factors for ions derived from these congeners are calculated relative to ^{37}Cl-TCDD/F. The analyst may use response factors for 1,2,3,4- or 2,3,7,8-TCDD, 1,2,3,4,7-PeCDD, or 1,2,3,4,7,8-HxCDD for quantitation of TCDDs/Fs, PeCDDs/Fs and HxCDDs/Fs, respectively. Implicit in this requirement is the assumption that the same response is obtained from PCDDs/Fs ccontaining the same numbers of chlorine atoms.

(c)(1) * * *

(2) For EPA Hazardous Wastes Nos. FO20, FO21, FO22, FO23, FO28, and FO27, the contingency plan must also include the procedures for responding to a spill or leak of these wastes from tanks into the containment system. These procedures shall include measures for immediate removal of the waste from the system and replacement or repair of the leaking tank.

15. In Subpart J of Part 264, add the following § 264.200:

§ 264.200 Special requirements for hazardous wastes FO20, FO21, FO22, FO23, FO28, and FO27.

(a) In addition to the other requirements of Subpart J, the following requirements apply to tanks storing or treating hazardous wastes FO20, FO21, FO22, FO23, FO28, and FO27.

(1) Tanks must have systems designed and operated to detect and adequately contain spills or leaks. The design and operation of any containment system must reflect consideration of all relevant factors, including:

(i) Capacity of the tank;

(ii) Volumes and characteristics of wastes stored or treated in the tank;

(iii) Method of collection of spills or leaks;

(iv) The design and construction materials of the tank and containment system; and

(v) The need to prevent precipitation and run-on from entering into the system.

(2) As part of the contingency plan required by Subpart D of Part 264, the owner or operator must specify such procedures for responding to a spill or leak from the tank into the containment system as may be necessary to protect human health and the environment. These procedures shall include measures for immediate removal of the waste from the system and replacement or repair of the leaking tank.

16. In Subpart K of Part 264, add the following section § 264.231:

§ 264.231 Special requirements for hazardous wastes FO20, FO21, FO22, FO23, FO28, and FO27.

(a) Hazardous Wastes FO20, FO21, FO22, FO23, FO28, and FO27 must not be placed in a surface impoundment unless the owner or operator operates the surface impoundment in accordance with a management plan for these wastes that is approved by the Regional Administrator pursuant to the standards set out in this paragraph, and in accord with all other applicable requirements of this Part. The factors to be considered are:

(1) The volume, physical, and chemical characteristics of the wastes, including their potential to migrate through soil or to volatilize or escape into the atmosphere;

(2) The attenuative properties of underlying and surrounding soils or other materials;

(3) The mobilizing properties of other materials co-disposed with these wastes; and

(4) The effectiveness of additional treatment, design, or monitoring techniques.

(b) The Regional Administrator may determine that additional design, operating, and monitoring requirements are necessary for surface impoundments managing hazardous wastes FO20, FO21, FO22, FO23, FO28, and FO27 in order to reduce the possibility of migration of these wastes to ground water, surface water, or air so as to protect human health and the environment.

17. In Subpart L of Part 264, add the following section § 264.259:

§ 264.259 Special requirements for hazardous wastes FO20, FO21, FO22, FO23, FO28, and FO27.

(a) Hazardous Wastes FO20, FO21, FO22, FO23, FO28, and FO27 must not be placed in waste piles that are not enclosed (as defined in §264.250(c)) unless the owner or operator operates the waste pile in accordance with a management plan for these wastes that is approved by the Regional Administrator pursuant to the standards set out in this paragraph, and in accord with all other applicable requirements of this Part. The factors to be considered are:

(1) The volume, physical, and chemical characteristics of the wastes, including their potential to migrate through soil or to volatilize or escape into the atmosphere;

(2) The attenuative properties of underlying and surrounding soils or other materials;

(3) The mobilizing properties of other materials co-disposed with these wastes; and

(4) The effectiveness of additional treatment, design, or monitoring techniques.

(b) The Regional Administrator may determine that additional design, operating, and monitoring requirements are necessary for piles managing hazardous wastes FO20, FO21, FO22, FO23, FO28, and FO27 in order to reduce the possibility of migration of these wastes to ground water, surface water, or air so as to protect human health and the environment.

18. In Subpart M of Part 264, add the following section § 264.283:

§ 264.283 Special requirements for hazardous wastes FO20, FO21, FO22, FO23, FO28, and FO27.

(a) Hazardous Wastes FO20, FO21, FO22, FO23, FO28 and FO27 must not be placed in a land treatment unit unless the owner or operator operates the facility in accordance with a management plan for these wastes that is approved by the Regional Administrator pursuant to the standards set out in this paragraph, and in accord with all other applicable requirements of this Part. The factors to be considered are:

(1) The volume, physical, and chemical characteristics of the wastes, including their potential to migrate through soil or to volatilize or escape into the atmosphere;

(2) The attenuative properties of underlying and surrounding soils or other materials;

(3) The mobilizing properties of other materials co-disposed with these wastes; and

(4) The effectiveness of additional treatment, design, or monitoring techniques.

(b) The Regional Administrator may determine that additional design, operating, and monitoring requirements are necessary for land treatment facilities managing hazardous wastes FO20, FO21, FO22, FO23, FO28, and FO27 in order to reduce the possibility of migration of these wastes to ground water, surface water, or air so as to protect human health and the environment.

19. In Subpart N of Part 264, add the following section § 264.317:

§ 264.317 Special requirements for hazardous wastes FO20, FO21, FO22, FO23, FO28, and FO27.

(a) Hazardous Wastes FO20, FO21, FO22, FO23, FO28, and FO27 must not be placed in a landfills unless the owner or operator operates the landfill in accord with a management plan for these wastes that is approved by the Regional Administrator pursuant to the standards set out in this paragraph, and in accord with all other applicable requirements of this Part. The factors to be considered are:

(1) The volume, physical, and chemical characteristics of the wastes, including their potential to migrate through the soil or to volatilize or escape into the atmosphere;

(2) The attenuative properties of underlying and surrounding soils or other materials;

(3) The mobilizing properties of other materials co-disposed with these wastes; and

(4) The effectiveness of additional treatment, design, or monitoring requirements.

(b) The Regional Administrator may determine that additional design, operating, and monitoring requirements are necessary for landfills managing hazardous wastes FO20, FO21, FO22, FO23, FO26, and FO27 in order to reduce the possibility of migration of these wastes to ground water, surface water, or air so as to protect human health and the environment.

20. In Subpart O of Part 264, amend § 264.343 by revising paragraph (a) and redesignating paragraph (a) as paragraph (a)(1), and adding a new paragraph (a)(2) to read as follows:

§ 264.343 Performance standards.

* * * * *

(a)(1) Except as provided in paragraph (a)(2), an incinerator burning hazardous waste must achieve a destruction and removal efficiency (DRE) of 99.99% for each principal organic hazardous constituent (POHC) designated (under § 264.342) in its permit for each waste feed. DRE is determined for each POHC from the following equation:

$$DRE = \frac{(W_{in} - W_{out})}{W_{in}} \times 100\%$$

where:

W_{in} = mass feed rate of one principal organic hazardous constituent (POHC) in the waste stream feeding the incinerator

and

W_{out} = mass emission rate of the same POHC present in exhaust emissions prior to release to the atmosphere.

(2) An incinerator burning hazardous wastes FO20, FO21, FO22, FO23, FO26, or FO27 must achieve a destruction and removal efficiency (DRE) of 99.9999% for each principal organic hazardous constituent (POHC) designated (under § 264.342) in its permit. This performance must be demonstrated on POHCs that are more difficult to incinerate than tetra-, penta-, and hexachlorodibenzo-*p*-dioxins and dibenzofurans. DRE is determined for each POHC from the equation in § 264.343(a)(1). In addition, the owner or operator of the incinerator must notify the Regional Administrator of his intent to incinerate hazardous wastes FO20, FO21, FO22, FO23, FO26, or FO27.

* * * * *

PART 265—INTERIM STANDARDS FOR OWNERS AND OPERATORS OF HAZARDOUS WASTE TREATMENT, STORAGE, AND DISPOSAL FACILITIES

21. The authority citation for Part 265 reads as follows:

Authority: Secs. 1006, 2002(a), 3004, and 3005 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1976, as amended (42 U.S.C. 6905, 6912(a), 6924, and 6925).

22. § 265.1 is amended by adding paragraph (d)

§ 265.1 Purpose, scope, and applicability.

* * * * *

(d) The following hazardous wastes must not be managed at facilities subject to regulation under this Part.

(1) EPA Hazardous Waste Nos. FO20, FO21, FO22, FO23, FO26, or FO27 unless:

(i) The wastewater treatment sludge is generated in a surface impoundment as part of the plant's wastewater treatment system;

(ii) The waste is stored in tanks or containers;

(iii) The waste is stored or treated in waste piles that meet the requirements of § 264.250(c) as well as all other applicable requirements of Subpart L of this Part;

(iv) The waste is burned in incinerators that are certified pursuant to the standards and procedures in § 265.352; or

(v) The waste is burned in facilities that thermally treat the waste in a device other than an incinerator and that are certified pursuant to the standards and procedures in § 265.383.

23. In Subpart O of Part 265, add the following § 265.352:

§ 265.352 Interim Status Incinerators Burning Particular Hazardous Wastes.

(a) Owners or operators of incinerators subject to this Subpart may burn EPA Hazardous Wastes FO20, FO21, FO22, FO23, FO26, or FO27 if they receive a certification from the Assistant Administrator for Solid Waste and Emergency Response that they can meet the performance standards of Subpart O of Part 264 when they burn these wastes.

(b) The following standards and procedures will be used in determining whether to certify an incinerator:

(1) The owner or operator will submit an application to the Assistant Administrator for Solid Waste and Emergency Response containing applicable information in §§ 270.19 and 270.62 demonstrating that the incinerator can meet the performance standards in Subpart O of Part 264 when they burn these wastes.

(2) The Assistant Administrator for Solid Waste and Emergency Response will issue a tentative decision as to whether the incinerator can meet the performance standards in Subpart O of Part 264. Notification of this tentative decision will be provided by newspaper advertisement and radio broadcast in the jurisdiction where the incinerator is located. The Assistant Administrator for Solid Waste and Emergency Response will accept comment on the tentative decision for 60 days. The Assistant Administrator for Solid Waste and Emergency Response also may hold a public hearing upon request or at his discretion.

(3) After the close of the public comment period, the Assistant Administrator for Solid Waste and Emergency Response will issue a decision whether or not to certify the incinerator.

24. In Subpart P of Part 265, add the following § 265.383:

§ 265.383 Interim Status Thermal Treatment Devices Burning Particular Hazardous Waste.

(a) Owners or operators of thermal treatment devices subject to this Subpart may burn EPA Hazardous Wastes FO20, FO21, FO22, FO23, FO26, or FO27 if they receive a certification from the Assistant Administrator for Solid Waste and Emergency Response that they can meet the performance standards of Subpart O of Part 264 when they burn these wastes.

(b) The following standards and procedures will be used in determining whether to certify a thermal treatment unit:

(1) The owner or operator will submit an application to the Assistant Administrator for Solid Waste and Emergency Response containing the applicable information in §§ 270.19 and 270.62 demonstrating that the thermal treatment unit can meet the performance standard in Subpart O of Part 264 when they burn these wastes.

(2) The Assistant Administrator for Solid Waste and Emergency Response will issue a tentative decision as to whether the thermal treatment unit can meet the performance standards in Subpart O of Part 264. Notification of this tentative decision will be provided by newspaper advertisement and radio broadcast in the jurisdiction where the thermal treatment device is located. The Assistant Administrator for Solid Waste and Emergency Response will accept comment on the tentative decision for 60 days. The Assistant Administrator for

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Solid Waste and Emergency Response also may hold a public hearing upon request or at his discretion.

(3) After the close of the public comment period, the Assistant Administrator for Solid Waste and Emergency Response will issue a decision whether or not to certify the thermal treatment unit.

PART 270—EPA ADMINISTERED PERMIT PROGRAMS: THE HAZARDOUS WASTE PERMIT PROGRAM

25. The authority citation for Part 270 reads as follows:

Authority: Secs. 1006, 2002(a), 3005, 3007, and 7004 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1976, as amended (42 U.S.C. 6905, 6912(a), 6925, 6927, and 6974).

26. In Subpart B of Part 270, paragraph (b)(7) of § 270.14 is revised to read as follows:

§ 270.14 Contents of Part B: General requirements.

* * * * *

(b) * * *

(7) A copy of the contingency plan required by Part 264, Subpart D. Note: Include, where applicable, as part of the contingency plan, specific requirements in §§ 264.227, 264.255, and 264.200.

* * * * *

27. In Subpart B of Part 270, §270.16 is amended by adding paragraph (g):

§ 270.16 Specific Part B information requirements for tanks.

* * * * *

(g) Where applicable, a description of the containment and detection systems to demonstrate compliance with § 264.200(a) must include at least the following:

(1) Drawings and a description of the basic design parameters, dimensions, and materials of construction of the containment system.

(2) Capacity of the containment system relative to the design capacity of the tank(s) within the system.

(3) Description of the system to detect leaks and spills, and how precipitation and run-on will be prevented from entering into the detection system.

28. In Subpart B of Part 270, § 270.17 is amended by adding paragraph (j):

§ 270.17 Specific Part B information requirements for surface impoundments.

* * * * *

(j) A waste management plan for EPA Hazardous Waste Nos. FO20, FO21, FO22, FO23, FO26, and FO27 describing how the surface impoundment is or will be designed, constructed, operated, and maintained to meet the requirements of § 264.231. This submission must address the following items as specified in § 264.231:

(1) The volume, physical, and chemical characteristics of the wastes, including their potential to migrate through soil or to volatilize or escape into the atmosphere;

(2) The attenuative properties of underlying and surrounding soils or other materials;

(3) The mobilizing properties of other materials co-disposed with these wastes; and

(4) The effectiveness of additional treatment, design, or monitoring techniques.

29. In Subpart B of Part 270, § 270.18 is amended by adding paragraph (j):

§ 270.18 Specific Part B information requirements for waste piles.

* * * * *

(j) A waste management plan for EPA Hazardous Waste Nos. FO20, FO21, FO22, FO23, FO26, and FO27 describing how a waste pile that is not enclosed (as defined in § 264.250(c)) is or will be designed, constructed, operated, and maintained to meet the requirements of § 264.259. This submission must address the following items as specified in § 264.259:

(1) The volume, physical, and chemical characteristics of the wastes to be disposed in the waste pile, including their potential to migrate through soil or to volatilize or escape into the atmosphere;

(2) The attenuative properties of underlying and surrounding soils or other materials;

(3) The mobilizing properties of other materials co-disposed with these wastes; and

(4) The effectiveness of additional treatment, design, or monitoring techniques.

30. In Subpart B of Part 270, § 270.20 is amended by adding paragraph (i):

§ 270.20 Specific Part B information requirements for land treatment facilities.

* * * * *

(i) A waste management plan for EPA Hazardous Waste Nos. FO20, FO21, FO22, FO23, FO26, and FO27 describing how a land treatment facility is or v be designed, constructed, operated, maintained to meet the requirement § 264.283. This submission must adc the following items as specified in § 264.283:

(1) The volume, physical, and chemical characteristics of the wast including their potential to migrate through soil or to volatilize or escape into the atmosphere;

(2) The attentuative properties of underlying and surrounding soils or other materials;

(3) The mobilizing properties of oth materials co-disposed with these wastes; and

(4) The effectiveness of additional treatment, design, or monitoring techniques.

31. In Subpart B of Part 270, § 270.21 amended by adding paragraph (j):

§ 270.21 Specific Part B information requirements for landfills.

* * * * *

(j) A waste management plan for EP Hazardous Waste Nos. FO20, FO21, FO22, FO23, FO26, and FO27 describin how a landfill is or will be designed, constructed, operated, and maintained to meet the requirements of § 264.317. This submission must address the following items as specified in § 264.317

(1) The volume, physical, and chemical characteristics of the wastes, including their potential to migrate through soil or to volatilize or escape into the atmosphere;

(2) The attenuative properties of underlying and surrounding soils or other materials;

(3) The mobilizing properties of other materials co-disposed with these wastes; and

(4) The effectiveness of additional treatment, design, or monitoring techniques.

PART 775—STORAGE AND DISPOSAL OF WASTE MATERIAL [REMOVED]

32. The authority citation for Part 775 reads as follows:

Authority: Sec. 6 of the Toxic Substances Control Act (TSCA) Pub. L. 94–469, 90 Stat. 2020 (15 U.S.C. 2605).

33. Part 775 is removed.

[FR Doc. 85–604 Filed 1–11–85; 8:45 am]

BILLING CODE 6560-50-M

ATTACHMENT C

DISPOSAL OF DIOXIN WASTES

ONMENTAL PROTECTION AGENC
WASHINGTON, D.C. 20460

MEMORANDUM

APR 10 1985

THE ADMINISTRAT

TO: Regional Administrators

SUBJECT: Disposal of Dioxin Wastes

EPA's rule listing dioxin wastes as hazardous under R
becomes effective July 14, 1985. It imposes special requir
and restrictions on management of dioxin wastes at treatment
storage and disposal facilities. The new rule will revoke t
current procedures in place under the TSCA "Vertac Rule", whi
allows case-by-case approval of proposals to treat or dispose
of dioxin wastes. EPA must move rapidly to assure that approv
capacity is available to manage the newly listed wastes proper

I ask that you and your staff take the initiative and
work within your Region to ensure adequate capacity for managin
dioxin wastes. You should, for example, identify those facilit.
that can manage dioxin wastes well, and encourage them to apply
for necessary Federal, State and local permits. You should also work closely with them to expedite their applications and support their applications with the public and State and local governments by emphasizing the need for capacity and our confidence in the technologies mandated in our regulations.

At the national level, we are taking a number of actions to implement this policy. We have provided in the regulations an accelerated approval process, called certification, for interim status incinerators and other thermal treatment units. We are preparing guidance to help expedite certification and permitting of dioxin facilities. We are working with industrial and State associations to encourage the private sector to respond with needed waste management capacity. Finally, we stand ready to provide expedited technical assistance and Headquarters reviews.

Your support for my policy is critical to the proper management of dioxin wastes.

Please contact Michael Cook, Dioxin Management Coordinator, (FTS 382-5864) for assistance in interpreting and implementing this guidance.

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Lee M Thomas

Lee M. Thomas

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ATTACHMENT D

CERTIFYING INCINERATORS AND THERMAL TREATMENT UNITS

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

18 JUN 1985

OFFICE OF
SOLID WASTE AND EMERGENCY RESPONSE

MEMORANDUM

SUBJECT: Certifying Incinerators and Thermal Treatment Units

FROM: Michael B. Cook
Deputy Director
Office of Solid Waste

Michael B Cook

TO: Waste Management Division Directors, Regions I - X
Hazardous Waste Branch Chiefs, Regions I - X

As discussed in his memorandum of April 10, 1985 (copy attached), the Administrator expects the Regions to take the initiative and work quickly to ensure adequate capacity for managing dioxin wastes. The recent listing of certain dioxin and dibenzo-furan containing wastes as acute hazardous wastes allows interim status incinerators and thermal treatment units, which want to manage these wastes before receiving a permit, to be certified by the Assistant Administrator for OSWER that they meet the Part 264 Subpart O performance standards. A copy of OSWER's final draft procedures for conducting the certification process is attached.

The certification process was developed as an interim measure to allow incinerators and thermal treatment units to handle dioxin wastes until they receive a RCRA permit. It can only meet the nation's needs for dioxin disposal if it is fast, much faster than the Part B permit process has proven to be in the past. Because of the delays with permitting, Regions must use the certification process, unless you can demonstrate that permitting will move as fast. When the certification process is used, the Notice of Deficiency should be mailed within two weeks of receipt of the application.

I would like to receive a copy of your expedited schedule shortly after you receive an application for certification, and any Part B application for managing dioxins. We anticipate working closely with you on these priority applications. I hope this will allow us to quickly resolve any problems that arise as we implement the new regulatory procedures.

This guidance is being distributed in final draft for your use. Please provide any comments to Art Glazer, manager of the PAT program, at 382-4692. We will revise the guidance if necessary based on comments after some experience with its use.

If you have questions on the priority for processing permits or certifications for dioxin waste, please contact me on 382-5864. If you have questions on the procedures for certifying incinerators or thermal treatment units, contact Arthur Glazer, or Barry Korb of the Dioxin Task Force staff at 382-4654.

Attachments

cc: John Skinner
Gene Lucero
John Lehman
Eileen Claussen
Bruce Weddle
Peter Guerrero
Truett DeGeare
Matt Straus
Arthur Glazer
Barry Korb
Steve Silverman
Permit Writers Incinerator Work Group
Regional Dioxin Policy Contacts

18 JUN 1985

OSWER Procedures for Certifying Incinerators and Thermal Treatment Units to Manage Dioxin Wastes

I. Background

The recent listing of certain dioxin and dibenzo-furan containing wastes as acute hazardous wastes imposed restrictions on the treatment, storage, or disposal of these wastes in interim status facilities. See, 50 FR 1978-2006, January 14, 1985. The only units which are eligible to receive interim status to manage dioxin wastes F020, F021, F022, F023, F026, or F027 are:

1. Surface impoundments holding wastewater treatment sludges that are generated in those impoundments as part of the plant's wastewater treatment system
2. Waste piles that are enclosed and meet the §264.250(c) requirements
3. Tanks
4. Containers
5. Incinerators, if certified
6. Thermal treatment units, if certified

F028 waste can be handled in any hazardous waste unit which has interim status. The burning of dioxin wastes in interim status incinerators or thermal treatment units requires the Assistant Administrator (AA) for the Office of Solid Waste and Emergency Response to "certify" that the unit is capable of meeting the 40 CFR Part 264 Subpart O performance standards for fully permitted facilities. The performance standards were amended to include a requirement that dioxin wastes be incinerated at 99.9999% destruction and removal efficiency (DRE)(50 FR 2005).

This guidance describes the certification process. Since EPA is seeking to ensure that approved capacity is available to manage dioxin wastes, all certification applications should be expeditiously processed. The certification procedures have been designed to provide frequent opportunities for communication between the Regions and Headquarters to ensure the overall Agency effort is expeditious and well-coordinated. Regional and Headquarters staffs must work closely together to take steps to expedite reviews and reach consensus on individual applications.

ATTACHMENT E

PROCEDURES FOR PLANNING AND IMPLEMENTING OFF-SITE RESPONSE ACTIONS

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

MAY 6 1985

OFFICE OF
SOLID WASTE AND EMERGENCY RESPONSE

MEMORANDUM

SUBJECT: Procedures for Planning and Implementing Off-site Response Actions

Jack W. McGraw

FROM: Jack W. McGraw
Acting Assistant Administrator

TO: Regional Administrators
Regions I-X

This memorandum addresses procedures that must be observed when a response action involving off-site storage, treatment or disposal of hazardous substances is selected under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), and the Resource Conservation and Recovery Act (RCRA). It prohibits use of a RCRA facility for off-site management of Superfund hazardous substances if it has significant RCRA violations[1] or other environmental conditions that affect the satisfactory operation of the facility. It also addresses requirements for analyzing and selecting response actions that involve permanent methods of managing hazardous substances.

In November of 1984, amendments to the Resource Conservation and Recovery Act were enacted. These amendments impose new requirements for the safe management of hazardous wastes. In the case of land disposal facilities, the amendments require that certain types of units (new, replacement and lateral extensions) be double lined by May 9, 1985. The amendments impose technical requirements to ensure that when land disposal facilities are used they are used safely.

EPA intends to follow the direction established by Congress in the RCRA amendments when undertaking on-site response actions and when response actions involve off-site management of hazardous substances. This memorandum details how the Agency plans to achieve these goals.

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[1] A significant violation includes a Class I violation as defined by the RCRA Enforcement Response Policy (December 21, 1984). This policy defines a Class I violation as a violation that results in a release or a serious threat of release of hazardous waste into the environment, or involves the failure to assure that ground water will be protected, that proper closure and post closure activities will be undertaken, or that hazardous wastes will be destined for and delivered to RCRA permitted or interim status facilities. The policy contains a list of examples of violations which are Class I violations. Regions

Section I of this memorandum discusses background issues. Section II A discusses the need to consider treatment, recycling and reuse before off-site land disposal is used. Section II B details procedures that must be followed in selecting any off-site facility for management of hazardous substances. This section also discusses the criteria to be used in making the selection. For facilities in assessment monitoring, this part states that conditions which lead to and result from being in assessment monitoring may constitute conditions that render the facility unsuitable for disposal of hazardous substances. Therefore, when a facility is in assessment, the conditions which lead to the required assessment, and any monitoring data, must be evaluated to determine if the facility poses such conditions. If so, the facility may not be used unless the owner or operator commits to correct the problems and the unit to be used for disposal poses no problems.

Section III discusses RCRA manifest requirements. Section IV discusses PCB disposal requirements. Finally, Section V details how this policy will be implemented. Attachment A is a chart summarizing the policy on use of off-site RCRA facilities. This chart should be used in conjunction with the policy document, not in lieu of it.

These procedures are applicable to all response and enforcement actions taken pursuant to CERCLA and section 7003 of RCRA.

This memorandum replaces guidance entitled "Requirements for Selecting an Off-Site Option in a Superfund Response Action", dated January 28, 1983. This policy is an interim one that the Agency intends to publish as a notice in the Federal Register in order to receive public comment on its provisions. After reviewing these comments EPA will determine whether revisions are necessary.

These revisions strengthen previous requirements in several ways:

- Coverage - This memorandum extends requirements to enforcement actions under §106 of CERCLA and §7003 of RCRA, and expands requirements for removal actions.

- Use of Treatment - These procedures require consideration of treatment, recycling or reuse for all response and enforcement actions, to foster the use of more permanent solutions, and, in the case of remedial actions, where cost-effective. The Agency is not certain whether sufficient capacity is available at this time to use treatment in all cases where it is feasible. As more information on capacity becomes available, the Agency will re-examine requirements for treatment to determine whether they can be strengthened. The previous procedures did not address use of treatment.

- Requirements for a treatment, storage or disposal facility Previous guidance required inspection within 12 months before contract award for storage, treatment or disposal. The revisions require inspection within six months of actual storage, treatment or disposal. It also stated that if a facility had deficiences that resulted in unsound treatment, storage or disposal practices it should not be used. The guidance also required RCRA violations that adversely affected facility performance to be corrected prior to contract award. Under the revisions, a facility that has significant RCRA violations or other environmental conditions that affect its satisfactory operation may not be used unless certain conditions are met. First, there must be a compliance agreement in place to correct all deficiencies at the facility; second, the unit that is used must not cause or contribute to significant problems at the facility. This provision recognizes that in some situations it is infeasible to complete correction of all violations prior to using a facility (for example, it may take several years before pumping and treating of ground-water is completed) and that there may be a unit at such a facility that is sound.

- Land Disposal Facilities - The 1984 RCRA amendments impose new requirements on land disposal facilities. When use of such facilities is contemplated, the policy requires that the facility meet these minimum technical requirements.

I. BACKGROUND

Facilities that are not in compliance with RCRA requirements may be unacceptable to use for treatment, storage or disposal of hazardous substances from response actions. Facilities used for management of substances in connection with response actions should not pose a significant threat to public health, welfare or the environment.

CERCLA contains two references to off-site management of hazardous substances. First, CERCLA section 104(c) requires, as a condition of Fund-financed remedial response, that the State assure the availability of an acceptable facility in compliance with the requirements of subtitle C of RCRA for any off-site management of hazardous substances. Second, where remedial measures include off-site storage, treatment, destruction or secure disposition, the statute also requires such measures to be more cost-effective than other remedial measures, create new disposal capacity in compliance with Subtitle C of RCRA or be necessary to protect public health, welfare or the environment from a present or potential risk which may be created by further exposure to substances. Section 300.65 (b)(6) of the National Contingency Plan (40 CFR 300) states that when off-site action is taken in connection with a removal action the facility used for off-site management must be in compliance with Subtitle C of RCRA. This memorandum establishes procedures for implementing these CERCLA and NCP provisions.

These procedures apply to all removal, remedial, and enforcement actions taken pursuant to CERCLA and section 7003 of RCRA. Any other parties undertaking cleanup under other authorities are urged to comply with these procedures. In the case of Superfund-financed removal actions or enforcement actions taken as a removal action in response to an immediate and significant threat, compliance with these procedures is mandatory unless the On-Scene Coordinator (OSC) determines that the exigencies of the situation require off-site treatment, storage or disposal without following the requirements. This exception may be used in cases where the OSC believes that the immediacy of the threat posed by the substances makes it imperative to remove the substances and there is insufficient time to observe these procedures without endangering public health, welfare or the environment. In such cases, the OSC should consider, to the extent possible, temporary solutions (e.g., interim storage) in order that the feasibility of using treatment can be evaluated prior to a decision to use land disposal. Also, in such cases, the OSC must provide a written explanation of his decision to the Regional Administrator. This explanation should be provided within 60 days of taking the action. In Regions in which authority to make removal decisions has not been fully delegated by the Regional Administrator, the decisions discussed above must be made by the Regional official that is delegated removal decision making authority.

II. PROCEDURES FOR SELECTING HAZARDOUS WASTE MANAGEMENT FACILITIES

This section discusses in detail the requirements Regions must follow in assessing and selecting an off-site RCRA facility for management of Superfund hazardous substances. Part A requires consideration of treatment, recycling or reuse for on-site and off-site actions in order to foster the use of more permanent methods of managing hazardous substances. These policies are consistent with directions taken by Congress in the 1984 amendments to the Resource Conservation and Recovery Act. Furthermore, Part B of this section establishes procedures Regions must use in selecting an off-site RCRA facility for management of hazardous substances. Where off-site land disposal must be used, this Part requires that disposal facilities be in compliance with the applicable technical requirements of RCRA.

A. Treatment

It is EPA's policy to pursue response actions that use treatment, reuse or recycling over land disposal to the greatest extent practicable, consistent with CERCLA requirements for cost-effective remedial actions. EPA requires that such alternatives be considered for all Fund-financed and private party removal and remedial actions. For Fund-financed removals or enforced actions in response to immediate and significant threats, treatment, reuse or recycling must be considered, unless the OSC determines that treatment, reuse or recycling methods are not reasonably available considering the exigencies of the situation, or they pose a significant environmental hazard.

When developing remedial alternatives, treatment, reuse or recycling must be considered. Such alternatives should not be screened out on the basis of cost alone. Section 300.68(h)(1) of the NCP allows rejection of alternatives during the screening stage based on cost, only when the cost of the alternative far exceeds the cost of others (e.g., by an order of magnitude) and does not provide substantially greater public health and environmental benefits.

Detailed analysis of these alternatives should include consideration of long-term effectiveness of treatment and comparative long and short term costs of treatment as compared to other remedial alternatives. Finally, when recommending and selecting the appropriate remedial action, treatment, reuse or recycling may be found more protective of public health and the environment than land disposal. Such alternatives may be recommended as the appropriate remedial action where the detailed analysis of alternatives shows that the alternative is more cost-effective than others in minimizing the damage to public health, welfare or the environment. During the next six months, EPA will be developing additional guidelines for evaluating the comparative long-term costs of treatment and land disposal.

At this time, the Agency does not know the current and projected treatment capacity available, nor the needs or capacity that will be required for Superfund actions in the future. Over the next several months, the Agency plans to undertake a study of available treatment and interim storage capacity and needs. Once completed, this analysis will provide information on treatment facilities currently operating for Regions to use. Additional information on capacity will be provided at a later date through a more comprehensive capacity survey being undertaken in support of the implementation of the 1984 RCRA amendments.

B. Requirements for selecting storage, treatment or disposal facilities

Selection of an appropriate facility for off-site management of hazardous substances requires that a judgment be made as to the overall acceptability of the facility to receive the substances and the acceptability of the unit that will receive the hazardous substances. In making this judgment the following steps must be observed:

1. The owner or operator of any hazardous waste management facility under consideration for off-site storage, treatment or

actions under CERCLA or section 7003 of RCRA must have an applicable RCRA permit or interim status.[2]

2. A RCRA compliance inspection must be performed at any hazardous waste management facility before it can receive hazardous substances from a response action. This inspection must assess whether there are any significant violations or other environmental conditions that affect the satisfactory operation of the facility. The RCRA compliance inspection must have taken place not more than six months prior to the storage, treatment or disposal of the hazardous substances from a response action. If the inspection has not taken place or is not scheduled, REM/FIT contractor personnel may conduct the inspection under the direction of the Deputy Project Officer, working in cooperation with RCRA Regional personnel. If Regions use contractor personnel, the Region should ensure that such personnel are adequately trained to conduct inspections. Further guidance on conducting inspections when a facility is being considered for management of hazardous substances will be issued in the near future. The FY 85 and FY 86 RCRA Implementation Plans establish compliance monitoring and enforcement targets. For FY 85 the guidance requires Comprehensive Ground-Water Monitoring Evaluations (CGMEs) at one third of the ground water monitoring facilities. Top priorities for this type of inspection are all facilities receiving wastes from Superfund sites.

In States with Phase I or II interim authorization or final authorization, the inspection should be conducted in accordance with State regulations or permit conditions. EPA Regions should always involve States when undertaking an inspection at a RCRA facility that is likely to accept Superfund wastes.

Regions must use the results from the inspection, along with other information, to determine whether the facility is an acceptable one.

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[2] Both permits and interim status apply to specific wastes and specific storage, treatment or disposal processes. The Remedial Project Manager (RPM) or OSC must determine that the facility's permit or interim status includes the wastes that would be transported to the facility and the type of process for which wastes are being taken to the facility. Because of these concerns, it is important that facility selection be coordinated with RCRA personnel. However, not all CERCLA substances are hazardous wastes under RCRA. Therefore, it is possible that a particular permit may not cover a hazardous substance that may be taken to the RCRA facility if it is not a hazardous waste. Moreover, in some situations a hazardous substance under CERCLA may trigger disposal requirements under other laws (for example, PCBs and some radioactive substances). In such cases the applicable requirements of these other laws must be observed.

3. It is EPA's policy to minimize the use of land disposal in accordance with the direction taken by Congress in amending RCRA. Where land disposal is used, these amendments establish new technical standards for land disposal facilities. New disposal units, lateral expansions and replacement units (defined as of November 8, 1984) of interim status landfills and surface impoundments must have at least two liners and a leachate detection, collection and removal system above (in the case of landfills) and between the liners, if they receive wastes after May 8, 1985. All Fund-financed and enforced response actions (removal and remedial) involving the off-site disposal of hazardous substances must involve use of disposal facilities that are in compliance with applicable RCRA minimum technical reqiurements. This means that units first receiving wastes after November 8, 1984 cannot receive wastes after May 8, 1985 if not double lined. The RCRA statute does allow continued use of existing units after that date. In considering whether to use an existing unit that does not meet the double liner requirements, the Agency will consider the toxicity, persistence and mobility of the hazardous substances and the need to segregate these substances from others. Such a unit can be used only if it is shown to adequately protect public health and the environment.

CERCLA hazardous substances which are not hazardous wastes under RCRA may, in some circumstances, be disposed of in other legal units. In such cases, disposal should take place in accordance with other legal requirements. Hazardous substances which are not hazardous wastes may be taken to a RCRA unit under the terms outlined in the preceeding paragraph, or to a unit legal under other statutory provisions (for example, PCBs may be disposed of in a TSCA approved disposal facility and radiocative materials in a radioactive materials disposal facility). This disposal must be consistent with Section 104(c)(3) of CERCLA, when applicable.

4. Interim status land disposal facilities under consideration for off-site disposal must have adequate ground water monitoring data to assess whether the facility poses a threat to ground water.[3] Due to the lack of compliance with RCRA ground water requirements, available data may not be adequate to assess the facility. Moreover, lack of evidence of contamination from the monitoring data does not necessarily mean the facility is secure. The monitoring data may be faulty. In addition, there may be other problems at the facility such as air emissions or surface run-off. Where doubt exists concerning the acceptability of a facility, an on-site inspection should be undertaken to specifically address these concerns. Where possible, this on-site inspection should be part of the required RCRA compliance inspection.

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[3] All remaining land disposal permit applications will be requested in FY 1985. These applications contain summaries of ground water monitoring data obtained during the interim status period, and are required to identify any plume contamination.

5. Using information gathered from the compliance inspection, other data sources (e.g., RCRA facility permit data), any other facility visits and all other relevant information, Regional Offices must evaluate and make a judgment on the acceptability of using the facility for storage, treatment or disposal of hazardous substances. For the facility as a whole, this evaluation should consider whether there are any RCRA violations or other environmental conditions[4] at the facility which affect its satisfactory operation. This evaluation should include consideration of facility operations as well as whether there are physical conditions at the facility that pose a significant threat to public health, welfare or the environment. For facilities in assessment monitoring, the conditions which lead to required assessment monitoring, as well as resulting monitoring data, must be evaluated. The evaluation also should consider the nature and quantity of the substances and whether it is feasible to treat the substances prior to land disposal to mitigate any adverse effects.

No Superfund hazardous substances shall be taken off-site to a RCRA facility if the Region determines that the facility has significant RCRA violations or other environmental conditions that affect the satisfactory operation of the facility, unless both the following conditions are met:

(1) The owner or operator must commit, through an enforceable agreement (i.e., consent order or decree), to correct the problem. The agreement must be signed before the facility may receive the hazardous substances. In addition, the Regional Administrator must determine that the agreement is likely to result in correction of the problem and the owner or operator of the facility is capable of compliance with the terms of the agreement; and

(2) Disposal only occurs within the facility at a new or existing unit that is in compliance with RCRA requirements. The new or existing unit must not contribute in any significant way to adverse conditions at the facility.

III. MANIFEST REQUIREMENTS

If an off-site option is chosen, a manifest for the transportation of the hazardous waste must be obtained. The manifest must be in compliance with RCRA for the transportation of hazardous wastes. The manifest must be a Uniform Hazardous Waste Manifest in compliance with requirements at 40 CFR 262 (see 49 FR 10490, March 20, 1984). The lead agency or other party undertaking the cleanup must ensure that the transporter properly notifies under RCRA section 3010. Where the lead agency allows contractors to fill out the manifest, the agency should ensure that the manifest is properly filed.

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[4] It is recognized that the RCRA regulations may not at this time cover all environmental conditions at a facility. Regional offices may consider other environmental factors at a facility under consideration including other State and/or Federal environmental laws. If a facility is in assessment monitoring, the conditions which lead to assessment monitoring may constitute environmental conditions that adversely affect facility operations. In such cases, Regions should assess the conditions at the facility prior to using the facility for Superfund purposes.

IV. PCB DISPOSAL REQUIREMENTS

Requirements for the disposal of PCBs are established in 40 CFR 761.60. Generally, these regulations require that whenever disposal of PCBs are undertaken, they must be incinerated, unless the concentrations are less than 50 ppm. If the concentrations are between 50 and 500 ppm, the rule provides for certain exceptions that provide alternatives to the incineration requirements. The principal alternative is disposal in an EPA approved landfill for PCBs. Landfills used for PCB disposal must be inspected within six months prior to disposal. Regions must determine the acceptability of the facility based on the same criteria used to evaluate RCRA facilities in Section II.B.5.

V. IMPLEMENTATION

Beginning (30 days from date this document is signed) all Records of Decision (RODs) and Enforcement Decision Documents (EDDs) for Superfund-lead and enforcement lead actions, respectively, must include a discussion of compliance with these procedures for alternatives involving off-site management of Superfund hazardous substances at RCRA facilities. Decision documents for removal actions also should include discussion of compliance with these procedures. It is recognized that actual offsite facility information will not be available at the ROD stage. However, the RI and FS should use actual off-site facilities in costing remedial alternatives, in order to have cost figures that are as accurate as possible. It is recognized that additional facilities are likely to be considered during the bidding process. Any facility ultimately selected for disposal, treatment or storage must meet the requirements of this policy.

Provisions requiring compliance with these procedures must be included in any contracts for response, cooperative agreements with States undertaking Superfund response and all enforcement agreements. For ongoing projects, these provisions will be implemented as follows:

RI/FS: The Regions shall immediately notify Agency contractors and States that 1) alternatives for off-site management of wastes must be evaluated pursuant to the provisions of this policy, and 2) consistent with the policy on other environmental laws, treatment alternatives should not be dropped during the screening stage.

RD: The Regions shall immediately notify Agency contractors, the States, and the U.S. Army Corps of Engineers that all remedies that include off-site disposal of hazardous substances must comply with the provisions of this policy pertaining to selection of an acceptable off-site facility.

RA: The Regions shall immediately assess the compliance status of land disposal facilities receiving hazardous wastes from ongoing projects. For a facility not in compliance, the Region should take immediate steps to bring the facility into compliance with the policy.

Enforcement: Actions currently under negotiation and all future actions must comply with these procedures. Existing agreements need not be amended. However, EPA reserves the right to apply these procedures to existing agreements, to the extent it is consistent with the release and reopener clauses in the settlement agreement (See the Interim CERCLA Settlement Policy, Part VII; Thomas, Price, Habicht; December 5, 1984).

If the response action is proceeding under a Federal-lead, the Regions should work with the Corps of Engineers or EPA Contracts Officer to negotiate a contracts modification to an existing contract, if necessary. If the response action is proceeding under a State-lead, the Regions should amend the cooperative agreement. Exceptions for existing contracts and cooperative agreements may be allowed on a case-by-case basis by the appropriate Headquarters Office Director.

All Regions must adopt procedures to implement and continually monitor compliance with these requirements. The procedures must include designation of a management official who is responsible for providing information on RCRA facilities in the Region to other Regions. It is the responsibility of the Region in which the RCRA offsite facility is located to assess the acceptability of the facility in consultation with the Region planning to ship wastes to the facility. The names of these officials should be provided to the Office of Waste Programs Enforcement by May 21, 1985. These names will then be forwarded to all Regions. If you have any questions concerning these procedures, please contact Sylvia K. Lowrance (FTS 382-4812).

Attachments

ATTACHMENT F

CERCLA COMPLIANCE WITH OTHER ENVIRONMENTAL STATUTES

OSC may authorize the use of the products without obtaining the concurrence of the EPA representative to the RRT or of the States and without consultation with other appropriate Federal agencies.

Appendix

Note.—This is an Appendix to the document and will not appear in the Code of Federal Regulations.

Memorandum

Subject: CERCLA Compliance With Other Environmental Statutes

From: Lee M. Thomas, Assistant Administrator

To: Regional Administrator Regions I–X

This memorandum sets forth the Environmental Protection Agency (EPA) policy on the applicability of the standards, criteria, advisories, and guidance of other State and Federal environmental and public health statutes to actions taken pursuant to sections 104 and 106 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). This policy addresses considerations for on-site and off-site actions taken under CERCLA.

I. Discussion

The National Contingency Plan (NCP) establishes the process for determining appropriate removal and/or remedial actions at Superfund sites. In the course of this process, EPA will give primary consideration to the selection of those response actions that are effective in preventing or, where prevention is not practicable, minimizing the release of hazardous substances so that they do not migrate to cause substantial danger to present or future public health, welfare, or the environment. As a general rule, this can be accomplished by pursuing remedies that meet the standards of applicable or relevant Federal public health or environmental laws. However, because of the unique circumstances at particular sites, there may be alternatives that do not meet the standards of other laws, but which still provide protection of public health, welfare, and the environment.

Although response actions which prevent hazardous substances from migrating into the environment are seen as the most effective under CERCLA, actions which minimize migration must also be considered since CERCLA primarily addresses inadequate *past* disposal practices and resulting unique site conditions. At certain sites, it may be technically impracticable, environmentally unacceptable or excessively costly to implement a response action that prevents migration or restores the site to its original, uncontaminated condition.

II. Policy

Section 104 of CERCLA requires that for off-site remedial actions, storage, destruction, treatment or secure disposition be in compliance with subtitle C of Resource Conservation and Recovery Act (RCRA). CERCLA is silent, however, concerning the requirements of other laws with regard to all other response actions taken pursuant to sections 104 and 106. As a general rule, the Agency's policy is to attain or exceed applicable or relevant environmental and public health standards in CERCLA response actions unless one of the specifically enumerated situations is present. Where such a situation is present and a standard is not used, the Agency must document and explain the reasons in the decision documents. Federal criteria and advisories, and State standards also will be *considered* in fashioning CERCLA remedies and, if appropriate, relevant portions will be used. If EPA does not use a relevant part of these standards, criteria or advisories in the remedial action, the decision documents will state the reasons.

A. On-site Response Actions

(1) For removal actions, EPA's policy is to pursue actions that will meet applicable or relevant standards, and criteria of other Federal environmental and public health laws to the maximum extent practicable, considering the exigencies of the situation.

(2) For remedial actions, EPA's policy is to pursue remedies that attain or exceed applicable and relevant standards of other Federal public health and environmental laws, unless specific circumstances, identified below, exist.

CERCLA procedural and administrative requirements will be modified to provide safeguards similar to those provided under other laws. Application for and receipt of permits is not required for on-site response actions taken under the Fund-financed or enforcement authorities of CERCLA.

B. Off-Site Response Actions

CERCLA removal and remedial activities that involve the removal of hazardous substances from a CERCLA site to off-site facilities for proper storage, treatment or disposal must be in compliance with all applicable or relevant standards of Federal environmental and public health statutes.

Off-site facilities that are used for storage, treatment, or disposal of Superfund wastes must have all appropriate permits or authorizations.

If the facility or process that is being considered for receipt of the Superfund wastes has not been permitted or authorized, the State or responsible party will be required to obtain all appropriate permits. A State's responsibility for obtaining any appropriate Federal, State or local permits (e.g. RCRA, TSCA, NPDES, Clean Air, etc.) will be specified in a contract or cooperative agreement with the State as part of its assurances required under section 104(c) of CERCLA.

III. Federal and State Requirements That May Be Relevant or Applicable to Response Actions

Federal and State environmental standards, guidance and advisories fall into two categories:

- Federal standards that are relevant or applicable.
- Other standards, criteria, advisories or guidance to be considered.

A complete list of both categories of requirements is attached. This list is our initial effort. A revised and annotated list will be included in the forthcoming Guidance for Feasibility Studies.

A. Federal Standards That Are Relevant or Applicable

Applicable standards are those standards that would be specifically triggered by the circumstances associated with the proposed Superfund remedy except for the fact that the proposed action would be undertaken pursuant to CERCLA section 104 or section 106.

Relevant standards are those designed to apply to circumstances sufficiently similar to those encountered at CERCLA sites in which their application would be appropriate at a specific site although not legally required. Standards also are relevant if they would be legally applicable to CERCLA § 104 or § 106 actions but for legal technicalities such as trigger dates or definitions. For example, TSCA PCB standards would be relevant even though the PCBs were produced prior to January 1978, which triggers TSCA requirements.

B. Other Requirements, Advisories or Guidances To Be Considered

This category includes other standards, criteria, advisories and guidance that may be useful in developing Superfund remedies. These requirements, advisories and guidances were developed by EPA, other Federal Agencies and the States. The data underlying these requirements may be used at Superfund sites in an appropriate way.

IV. Implementation

A. Removal Actions

For both on and off-site removal actions, the On-Scene-Coordinator should consult with the Regional Response Team within the framework of the Regional Contingency Plan to determine the most effective action.

(1) *On-site.* For on-site removal actions, the OSC should attempt to *attain* all Federal applicable or relevant public health or environmental standards. The OSC also should *consider* other Federal criteria, guidance and advisories as well as State standards in formulating the removal action. However, because removal actions often involve situations requiring expeditious action to protect public health, welfare, or the environment, it may not always be feasible to fully meet them. In those circumstances where they cannot be attained, the decision documents, OSC reports, or other documents should specify the reasons.

(2) *Off-site.* Off-site facilities that are used for storage, treatment, or disposal of Superfund wastes must have all appropriate permits or authorizations.

B. Remedial Actions

1. *Presentation and Analysis of Alternatives.* As part of the feasibility study (FS), at least one alternative for each of the following must, at a minimum, be evaluated within the requirements of the feasibility study guidance and presented to the decision-maker.

(a) Alternatives for treatment or disposal in an off-site facility, as appropriate;[1]

(b) Alternativs which *attain* applicable and relevant Federal public health or environmental standards;

(c) As appropriate, alternatives which *exceed* applicable and relevent public health or environmental standards;

(d) Alternatives which do not attain applicable or relevant public health or environmental standards but will reduce the likelihood of present or future threat from the hazardous substances. This must include an alternative which closely approaches the level of protection provided by the applicable or relevant standards and meets CERCLA's objective of adequately protecting public health, welfare and environment;

(e) A no action alternative.

In some cases, there may be some overlap between these alternatives.

2. *Selection of Remedy.* The decision-maker will consider all of the alternatives arrayed in the feasibility study and will give primary consideration to remedies that attain or exceed applicable or relevant Federal public health and environmental standards. Where the selected remedy involves an EPA standard, criterion, or advisory, the decision-maker will ensure appropriate coordination with affected EPA programs.

In appropriate cases, the decision-maker may select a remedial action that includes both on and off-site components.

The decision-maker may select an alternative that does not attain applicable or relevant standards in one of the following circumstances, recognizing that a consideration in making this determination is the extent to which the standard was intended to apply to the specific circumstances present at the site.[2]

a. The selected alternative is not the final remedy and will become part of a more comprehensive remedy;

b. All of the alternatives which meet applicable or relevant standards fall into one or more of the following categories:

(i) *Fund-Balancing*—For Fund-financed actions only; exercise the Fund-balancing provisions of CERCLA section 104(c)(4);

(ii) *Technically impracticality*—It is technically impractical from an engineering perspective to achieve the standard at the specific site in question;

(iii) *Unacceptable environmental impacts*—All alternatives that attain or exceed standards would cause unacceptable damage to the environment; or

(c) Where the remedy is to be carried out pursuant to CERCLA section 106; the Hazardous Response Trust Fund is unavailable or would be used; there is a strong public interest in expedited clean up; and the litigation probably would not result in the desired remedy.

Where one of these situations is present, the decision-maker *may* select an alternative which does not attain or exceed applicable or relevant public health or environmental standards. The basis for not meeting the standard must be fully documented and explained in the appropriate decision documents.

The Agency anticipates that most of CERCLA remedial actions *will* attain or exceed applicable or relevant public health or environmental standards. However, where the specific circumstances discussed above preclude the selection of a remedy that attains standards, the decision-maker will select the alternative that *most closely approaches the level of protection* provided by the applicable or relevant standard, considering the reasons for not meeting that standard.

EPA also will use appropriate Federal public health and environmental criteria, advisories, and guidance and State standards in developing appropriate remedial alternatives. If the decision-maker determines that such standards, criteria, advisories or guidance are relevant, but are not used in the selected remedial alternative, the decision documents will indicate the basis for not using them.

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[1] These alternatives must be consistent with forthcoming guidance on "Procedures for Implementing CERCLA Delegations for Off-Site Response Actions." In some cases, off-site disposal or treatment may not be feasible and this alternative may be eliminated during initial screening of alternatives. The decision documents should reflect this screening.

[2] In determining whether a particular standard is applicable or relevant the decision-maker should refer to the attached list "Applicable or Relevant Requirements." For example, RCRA did not "contemplate" the regulation of the indiscriminant disposal of waste over 210 miles of roadway, or the contamination of a river bed with hazardous waste. In such situations, RCRA regulations would *not* be applicable per se, but on a case-by-case basis part of the regulation may be relevant.

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For Fund-financed actions, where State standards are part of the cost-effective remedy, the Fund will pay to attain those standards. Where the cost-effective remedy does not include those State standards, the State may pay the difference to attain them.

3. *Administrative and Procedural Aspects.* The following modifications will be made to the Superfund community relations program to ensure that it provides a similar level of public involvement to that provided by the permitting programs of other environmental laws:

- A fact sheet should be included with the public notice and feasibility study which is provided to the public 2 weeks before the 3 week public comment period. The fact sheet will clearly summarize the feasibility study response alternatives and other issues, including which alternatives attain or exceed public health and environmental standards and criteria. For those alternatives that do not attain applicable and relevant standards of other public health and environmental laws, the fact sheet shall identify how they fail to attain the standards and explain how they nonetheless meet the goals of CERCLA. The public notice should include a timetable in which a decision will be reached, any tentative determinations which the Agency has made, the location where relevant documents can be obtained, identification of community involvement opportunities, the name of an Agency contact and other appropriate information.
- A public notice and updated fact sheet should be prepared upon (1) Agency selection of the final response action and (2) upon completion of the final engineering design. Prior to selecting the final engineering design, the Agency may hold a public meeting to inform the public of the design alternatives and solicit comments.
- If a remedy is identified that is different from those proposed during the feasibility study public comment period, a new 3 week public comment period may be required prior to amending the record of decision, taking into consideration the features of the alternatives addressed in the public comment period.

In addition, certain aspects of the CERCLA administrative process may be modified to assure comparability with the administrative requirements (i.e. recordkeeping, monitoring) of the other environmental programs.

The CERCLA enforcement community relations program will also be modified to provide for an enhanced public participation program for both consent decrees and administrative orders. This program will be substantially equivalent to the revised program for Fund-financed actions. Furthermore, consent decrees and administrative orders will incorporate administrative requirements (i.e. recordkeeping, monitoring) similar to those mandated by other environmental programs.

V. Applicability of Policy

This policy applies to three different situations:

- A site specific FS has not yet been initiated.
- The FS has been initiated, but the remedy has not yet been selected.
- The FS is completed and the remedy has been selected.

All sites where the FS has not yet been initiated must meet all of the requirements of this policy.

Where the FS has been initiated and the remedy has not yet been selected, the requirements of this policy do not apply to Record of Decisions (RODs) signed before March 1, 1985. RODs signed before March 1, 1985, should present to the decision-maker at least one alternative that attains or exceeds applicable or relevant standards and, if it is not selected should indicate the reasons why it was not selected.

Where the FS is complete and the remedy has been selected, the decision-maker may on a case-by-case basis revise the selected remedy.

If you have any questions or comments, please contact William N. Hedeman, Director, Office of Emergency and Remedial Response (FTS 382-2180) or Douglas Cohen of his Policy Analysis Staff (FTS 382-3044).

Attachment

Applicable or Relevant Requirements

1. Office of Solid Waste

- Open Dump Criteria (RCRA Subtitle D, 40 CFR Part 257)

Note.—Only relevant to nonhazardous wastes. In most situations Superfund wastes will be handled in accordance with RCRA Subtitle C requirements.

- Hazardous Waste Regulations (RCRA Subtitle C, 40 CFR Part 264) including liner, cap, groundwater, and closure requirements under the following subparts:

F. Ground-Water Protection
G. Closure and Post Closure
H. Containers
I. Tanks
J. Surface Impoundments
K. Waste Piles
L. Land Treatment
M. Landfills
N. Incinerators

2. Office of Water

- Maximum Contaminant Levels (for *all* sources of drinking water exposure).
- Underground Injection Control Regulations.
- State Water Quality Standards (apply for surface water discharge).
- Requirements established pursuant to section 301 and section 403(c) of the Clean Water Act.
- Ocean Dumping Requirements including incineration at sea.
- Pretreatment standards for discharge into a publicly owned treatment works.

3. Office of Pesticides and Toxic Substances

- "PCB Requirements including Disposal and Marking Rule (43 FR 7150, 2-17-78); PCB Ban Rule (44 FR 31514, 5-31-79) PCB Electrical Equipment Rule (47 FR 37342, August 25, 1982); Uncontrolled PCBs Rule (49 FR 28172, July 10, 1984) and other related rulemakings."
- 40 CFR 775 Subpart J—Disposal of Waste Material Containing TCDD.

4. Office of External Affairs

- Guidelines for Specification of Disposal Sites for Dredged or Fill Material (section 404(b)(1) Guidelines, 40 CFR Part 230).
- Denial or Restriction of Disposal Site for Dredged Material: Final rule (section 404(c)).

5. Office of Air and Radiation

- Uranium mill tailing rules.
- National Ambient Air Quality Standards.
- High and low level radioactive waste rule.
- Asbestos disposal rules.

6. Other Federal Requirements

- OSHA requirements.
- Preservation of scientific, historical or archaeological data.
- D.O.T. Hazardous Materials Transport Rules.
- Regulation of activities in or affecting waters of the United States pursuant to 33 CFR 320-329.
- The following requirements are triggered by fund-financed actions:

—Preservation of rivers on the national inventory, Wild and Scenic Rivers Act, section 40 CFR 6.302(e).
—Protection of threatened or endangered species and their habitats.

—Conservation or Wildlife Resources.
—Executive Orders related to Floodplains (11988) and Wetlands (11990).
—Coastal Zone Management Act.

Other Requirements, Advisories and Guidance To Be Considered

1. Federal Requirements, Advisories and Procedures

- Recommended Maximum Concentration Limits (RMCLs).
- Health Advisories, EPA, Office of Water.
- Federal Water Quality Criteria.

Note.—Federal water quality criteria are not legally enforceable. State water quality standards, developed using appropriate aspects of Federal water quality criteria, are legally enforceable. In many cases, States water quality standards do not include specific numerical limitations on a large number of priority pollutants. When there are no numerical state standards for a given pollutant, Federal water quality criteria should be considered.

- Pesticide and Food additive tolerances and action levels data.

Note.—Germane portions of tolerances and action levels may be relevant in certain situations.

- Waste load allocation procedures, EPA Office of Water.
- Federal Sole Source Aquifer requirements.
- Public health basis in listing decisions under sec. 112 of the Clean Air Act.
- EPA's groundwater protection strategy.
- New Source Performance Standards for Storage Vessels for Petroleum Liquids.
- TSCA health data.
- Pesticide registration data.
- TSCA chemical advisories (2 or 3 issued to date).
- Advisories issued by FWS and NWPS under the Fish and Wildlife Coordination Act.
- National Environmental Policy Act.
- Floodplain and Wetlands Executive Orders.
- TSCA Compliance Program Policy.

2. State Requirements

- State Requirements on Disposal and Transport of Radioactive wastes.
- State Approval of Water Supply System Additions or Developments.
- State Ground Water Withdrawal Approvals.
- Requirements of authorized (Subtitle C of RCRA) State hazardous waste programs.
- State Implementation Plans and Delegated Programs Under Clean Air Act.
- All other State requirements, not delegated through EPA authority.

Note.—Many other State and local requirements could be relevant. The guidance for feasibility studies will include a more comprehensive list.

3. USEPA RCRA Guidance Documents

A. EPA's RCRA Design Guidelines

(1) Surface Impoundments, Liners Systems, Final Cover and Freeboard Control.
(2) Waste Pile Design—Liner Systems.
(3) Land Treatment Units.
(4) Landfill Design—Liner Systems and Final Cover.

B. Permitting Guidance Manuals

(1) Permit Applicant's Guidance Manual of Hazardous Waste Land Treatment, Storage, Disposal Facilities.
(2) Permit Writer's Guidance Manual for Hazardous Waste Land Treatment, Storage, Disposal Facilities.
(3) Permit Writer's Guidance Manual for Subpart F.
(4) Permit Applicants Guidance Manual for the General Facility Standards.
(5) Waste Analysis Plan Guidance Manual.
(6) Permit Writer's Guidance Manual for Hazardous Waste Tanks.
(7) Model Permit Application for Existing Incinerators.
(8) Guidance Manual for Evaluating Permit Applications for the Operation of Hazardous Waste Incinerator Units.
(9) A Guide for Preparing RCRA Permit Applications for Existing Storage Facilities.
(10) Guidance Manual on closure and post-closure Interim Status Standards.

C. Technical Resource Documents (TRDs)

(1) Evaluating Cover Systems for Solid and Hazardous Waste.
(2) Hydrologic Simulation of Solid Waste Disposal Sites.
(3) Landfill and Surface Impoundment Performance Evaluation.
(4) Lining of Water Impoundment and Disposal Facilities.
(5) Management of Hazardous Waste Leachate.
(6) Guide to the Disposal of Chemically Stabilized and Solidified Waste.
(7) Closure of Hazardous Waste Surface Impoundments.
(8) Hazardous Waste Land Treatment.
(9) Soil Properties, Classification, and Hydraulic Conductivity Testing.

D. Test Methods for Evaluating Solid Waste

(1) Solid Waste Leaching Procedure Manual.
(2) Methods for the Prediction of Leachate Plume Migration and Mixing.
(3) Hydrologic Evaluation of Landfill Performance (HELP) Model Hydrologic Simulation on Solid Waste Disposal Sites.
(4) Procedures for Modeling Flow Through Clay Liners.
(5) Test Methods for Evaluating Solid Wastes.
(6) A Method for Determining the Compatibility of Hazardous Wastes.
(7) Guidance Manual on Hazardous Waste Compatibility.

4. USEPA Office of Water Guidance Documents

A. Pretreatment Guidance Documents

(1) 304(g) Guidance Document Revised Pretreatment Guidelines (3 Volumes).

Provides technical data describing priority pollutants and their effects on wastewater treatment processes to be used in developing local limits; describes technologies applicable to categorical industries.

B. Water Quality Guidance Documents

(1) Ecological Evaluation of Proposed Discharge of Dredged Material into Ocean Waters (1977).
(2) Technical Support Manual: Waterbody Surveys and Assessments for Conducting Use Attainability Analyses (1983).

Outlines methods for conducting use attainability analyses under the Clean Water Act.

(3) Water-Related Environmental Fate of 129 Priority Pollutants (1979).

Describe the transformation and transportation of priority pollutants.

(4) Water Quality Standards Handbook (1983).

Provides an overview of the Criteria Standards Program under the Clean Water Act and outlines methods for conducting criteria standards modification.

(5) Technical Support Document for Water Quality-based Toxics Control.

C. NPDES Guidance Documents

(1) NPDES Best Management Practices Guidance Manual (June 1981).

Provides a protocol for evaluating BMPs for controlling discharges of toxic and hazardous substances to receiving waters.

(2) Biomonitoring Guidance, July 1983, subsequent biomonitoring policy statements, and case studies on toxicity reduction evaluation (May 1983).

D. Ground Water/UIC Guidance Document

(1) Designation of a USDW.
(2) Elements of Aquifer Identification.

(3) Interim guidance for public participation.

(4) Definition of major facilities.

(5) Corrective action requirements.

(6) Requirements applicable to wells injecting into, through or above an aquifer which has been exempted pursuant to § 146.104(b)(4).

(7) Guidance for UIC implementation on Indian lands.

5. USEPA Manuals From the Office of Research and Development

(1) SW 846 methods—laboratory analytic methods.

(2) Lab protocols developed pursuant to Clean Water Act section 304(h).

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

MAY 2 6 1985

APR 10 1985

MEMORANDUM

THE ADMINISTRATOR

TO: Regional Administrators

SUBJECT: Disposal of Dioxin Wastes

EPA's rule listing dioxin wastes as hazardous under RCRA becomes effective July 14, 1985. It imposes special requirements and restrictions on management of dioxin wastes at treatment, storage and disposal facilities. The new rule will revoke the current procedures in place under the TSCA "Vertac Rule", which allows case-by-case approval of proposals to treat or dispose of dioxin wastes. EPA must move rapidly to assure that approved capacity is available to manage the newly listed wastes properly.

I ask that you and your staff take the initiative and work within your Region to ensure adequate capacity for managing dioxin wastes. You should, for example, identify those facilities that can manage dioxin wastes well, and encourage them to apply for necessary Federal, State and local permits. You should also work closely with them to expedite their applications and support their applications with the public and State and local governments by emphasizing the need for capacity and our confidence in the technologies mandated in our regulations.

At the national level, we are taking a number of actions to implement this policy. We have provided in the regulations an accelerated approval process, called certification, for interim status incinerators and other thermal treatment units. We are preparing guidance to help expedite certification and permitting of dioxin facilities. We are working with industrial and State associations to encourage the private sector to respond with needed waste management capacity. Finally, we stand ready to provide expedited technical assistance and Headquarters reviews.

Your support for my policy is critical to the proper management of dioxin wastes.

Please contact Michael Cook, Dioxin Management Coordinator, (FTS 382-5864) for assistance in interpreting and implementing this guidance.

Lee M. Thomas

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II. Certification Processing Procedures

Interim status incinerators and thermal treatment units which want to manage dioxin wastes before receiving a permit must be certified by the AA that they meet the Part 264 Subpart O performance standards before the units can burn these wastes. Because the Regions have the personnel and expertise, and because the Regions are generally more familiar with the facilities applying for certification, the Regions will review certification applications and prepare the documentation for the AA (in accordance with this guidance). The Regions should expedite the processing of the certification applications in accordance with the Administrator's April 10,1985, memo (copy attached). The Dioxin Task Force staff will monitor the review process in the Regions, ask the Regions to provide milestones for individual application reviews, and provide general technical assistance.

Headquarters staff in the Incinerator PAT Program and the DDAG are also available to assist the Regions in their review of certification requests. To ensure the reviews are timely and beneficial, the Regions must clearly define the issues on which PAT and DDAG assistance is needed. All requests for PAT and DDAG assistance for certification reviews should be directed to Arthur Glazer, Permits Branch, at FTS 382-4692.

If the Region (or authorized State) has not inspected the facility within the last 6 months, the Region and/or State should inspect the facility and advise the AA of any noncompliance with RCRA found at the facility, as well as any pending enforcement actions.

The Region should prepare a memo from the RA to the AA assessing the certification application, send a copy to the PAT, and be prepared to brief the AA, if the Region or AA believes a briefing is necessary. The PAT will review the Regional package for national consistency and to be familiar with the facility in case the AA asks for PAT input in his decision-making process This memo should transmit copies of:

1. Tentative decision for AA's signature (see Attachment B)
2. A document summarizing the data submitted and a technical evaluation of it, which provides the basis for the certification conditions that the Region is recommending
3. Fact sheet or statement of basis
4. A document which discusses any RCRA noncompliance at the facility and all pending EPA or State enforcement actions
5. The public participation plan for the facility

If a briefing is necessary, the certification package should be received by the AA and PAT at least 10 working days before the Region is scheduled to brief the AA. Regions are strongly encouraged to send drafts of these materials to HQ in advance to reduce the possibility that any last minute concerns might arise from Headquarters review.

The AA will make a tentative decision to deny or approve the certification. The regulations require the AA to issue public notice of that decision (50 FR 2005). Public notices will be issued in accordance with Section 124.10. A sixty day public comment period with opportunity for a public hearing then follows. The Region will be responsible for issuing the public notices, and preparing the response to public comments. The Region will then prepare a final decision package for the AA's signature. The response to public comments and the final decision package will be sent to the AA for his signature and a copy to the PAT.

When the AA makes a final decision to grant or deny the certification, the certification will become effective immediately. The AA's decision is final Agency action (50 FR 1990).

III. State Coordination

Before reviewing the certification application, the Region should contact the State hazardous waste agency to determine if they will allow the interim status facility to burn dioxin wastes if EPA certifies the facility meets the Part 264 Subpart O performance standards. If the State indicates the facility may not burn dioxin wastes, the Region should work with the State and the facility to try to resolve any problems or issues the State has identified. If the State has a State Certification program similar to EPA's and the company seeks certification, then the State and Regional Offices should jointly review and process the company's application for certification.

If the facility chooses to seek a permit rather than certification, and the State hazardous waste program has not received specific authorization for the dioxin regulations under the HSWA (1984 Hazardous and Solid Waste Amendments), then EPA must issue a HSWA permit to the facility imposing the more stringent dioxin regulations (50 FR 1997). Regions must process the dioxin applications jointly with the authorized States and issue the HSWA permits simultaneously with the HW permits so dioxin treatment capacity is permitted as quickly as possible.

IV. Certification Application Requirements

Although a full Part B application does not have to be submitted for a certification request, the regulations (50 FR 1990) require the applicant to submit the information required by 40 CFR §270.19(b) and (c) and §270.62. The applicant must submit the following major items (see regulations for specific details):

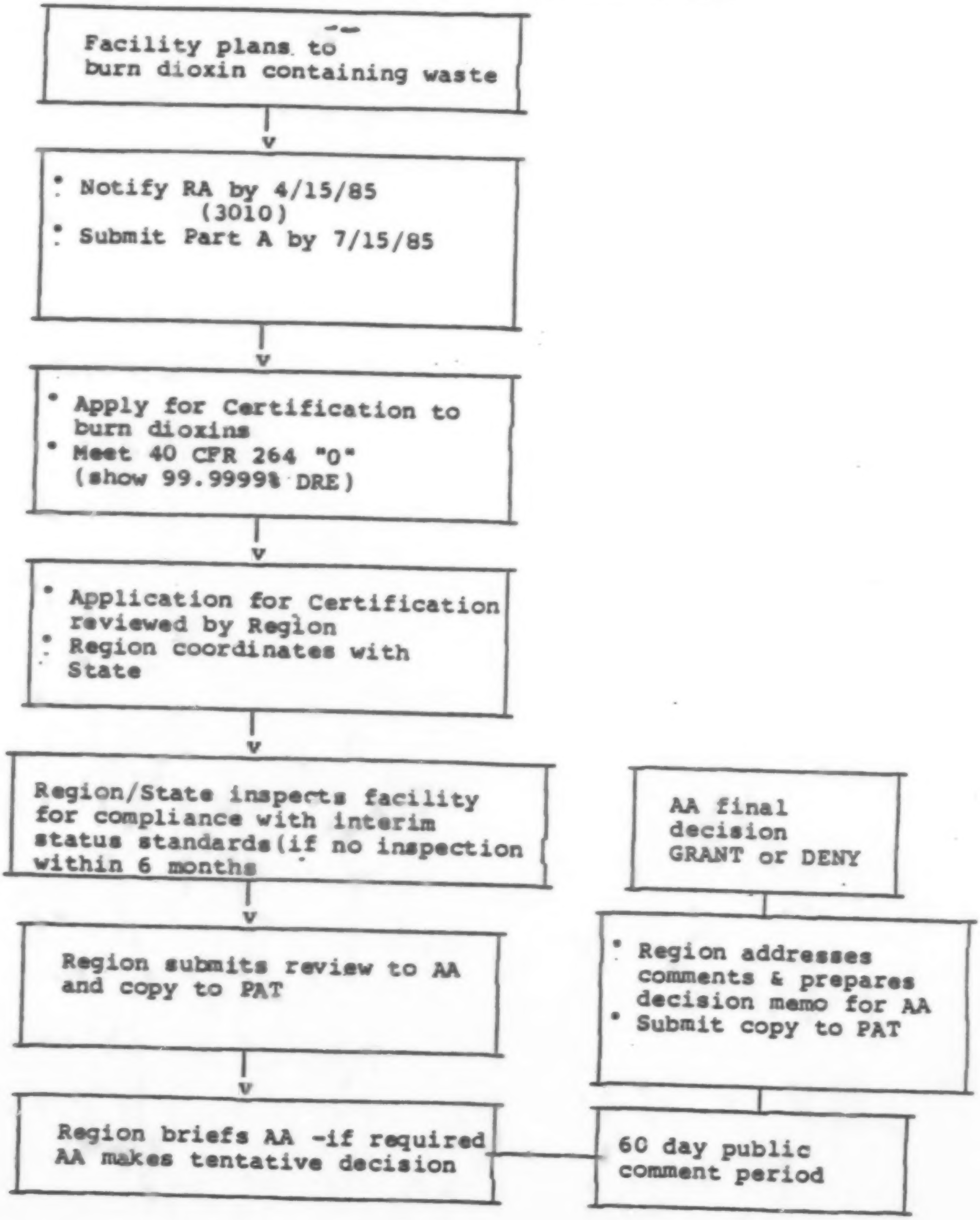
1. Trial burn data, or
2. A trial burn plan and later the trial burn data, or
3. Data in lieu of a trial burn . If data in lieu of a trial burn is submitted, the applicant must submit a detailed comparison of the unit to be certified and the unit on which the data was taken.
4. Waste analysis (heat value, viscosity, POHCs, detailed physical and chemical analysis).
5. Detailed engineering description of the incinerator or thermal treatment system, including all continuous monitoring equipment and automatic waste feed cut off systems.
6. The parameters measured during the trial burn.
7. Calculations for DRE, HCl and particulate emission rates.

A unit cannot burn dioxin wastes beginning July 15,1985, until the AA certifies that it meets the Subpart O performance standards. If the unit was not tested prior to July 15, 1985 for the DRE of dioxin, then the facility must obtain certification of the unit using a surrogate POHC which is more difficult to burn than the most difficult dioxin or furan isomer to be burned.

Facilities applying for certification under interim status must recognize that there will be two public participation periods: one for the dioxin certification (60 days) and another for the Hazardous Waste (HW) permit (45 days).

ATTACHMENT A

CERTIFICATION PROCEDURES


Facility plans to burn dioxin containing waste
• Notify RA by 4/15/85 (3010)
• Submit Part A by 7/15/85
• Apply for Certification to burn dioxins
• Meet 40 CFR 264 "O" (show 99.9999% DRE)
• Application for Certification reviewed by Region
• Region coordinates with State
Region/State inspects facility for compliance with interim status standards(if no inspection within 6 months
Region submits review to AA and copy to PAT
Region briefs AA -if required AA makes tentative decision
60 day public comment period
• Region addresses comments & prepares decision memo for AA
• Submit copy to PAT
AA final decision GRANT or DENY

ATTACHMENT B
Model

Tentative/Final Decision Regarding Certification of a RCRA Interim Status Facility to Burn Hazardous Wastes containing PCDD and/or PCDFs*

Facility Name:

Facility Location:

Facility Operator:

Facility Owner (s):

Type of Unit:

[Give brief decription of the incinerator or thermal treatment unit. Include a discussion of what monitoring equipment, continuous monitors and automatic waste cut off systems are present.]

Type of Wastes:

[List or describe the dioxin wastes the facility is allowed to burn under the certification. Address the physical matrice. If a POHC more difficult than the most difficult to combust isomer of dioxin and furans was not used in trial burn then address which isomers can and cannot be burned in the unit.]

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* PCDFs = all isomers of chlorinated dibenzofurans
PCDDs = all isomers of chlorinated dibenzo-p-dioxins

Documents Reviewed

- Notification form dated ____________ [must be postmarked prior to April 15, 1985].
- Part A (Forms 1 and 3) dated ____________ [must be postmarked prior to July 15, 1985].
- Certification application dated ____________ as amended on ____________, ____________, ____________ [fill in blanks as appropriate].

Tentative/Final Decision

Pursuant to the Resource Conservation and Recovery Act (RCRA), the 1984 Hazardous and Solid Waste Amendments (HSWA) and the regulations promulgated thereunder on January 14, 1985, I have determined, that the unit described above meets the 40 CFR Part 264 Subpart O performance standards when operated as follows:

1. Maximum Carbon Monoxide (CO) level in stack exhaust gas:
2. Maximum waste feed rate:
3. Minimum combustion temperature of ____________ as measured by ____________.
4. Combustion gas velocity of no less than ______ or no greater than _______ as measured by ____________.
5. [Any other operating conditions that are necessary to assure compliance with the DRE, HCl and particulate standards such as pressure drop accross venturi, scrubber water flow rate, pH of scrubber water.]

To assure that the unit is operated as specified above, when burning dioxin wastes the operator must continuously record the following operating conditions:

CO in stack gas, waste feed rate, combustion temperature, combustion gas velocity,...

____________________ ______________________________________

date

Assistant Administrator
Office of Solid Waste & Emergency Response

ATTACHMENT G

LABORATORY EVALUATION OF METHOD 8280

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JUL 12 1985

OFFICE OF
SOLID WASTE AND EMERGENCY RESPONSE

MEMORANDUM

SUBJECT: Laboratory Evaluation of Method 8280

FROM: David Friedman, Manager
Methods Program (WH-562B)

TO: Ronald Mitchum, Director
Quality Assurance Division
EMSL-Las Vegas

The OSW has reviewed and made recommendation on the draft report "Single Laboratory Evaluation of the RCRA Method for Analysis of Dioxin in Hazardous Waste" (Appendix A). In view of these recommendations, comments returned in response to the CLP's multilaboratory Method 8280 evaluation bid proposal, and EMSL-Las Vegas concerns, the Methods Program believes that a multi-laboratory evaluation of Method 8280 at this time would be premature. We suggest that the remainder of FY-85 be used to complete the single laboratory evaluation as originally scheduled in the August 1984 ORD work plan. We will prepare a detailed work plan for the remainder of FY-85 during the SW-846 workgroup meeting on July 23, 1985. Included in the work plan will be the immediate analysis of representative matrices samples supplied by the Listing Program and documentation of detection limits for all tested matrices.

To aid in the evaluation process; the Methods Program will fund a 2 month familiarization portion of a 3 laboratory confirmatory testing study. The CLP will initiate the study by July 29, 1985. The confirmatory study, as outlined in the ORD's "Guidelines for Validation of US EPA's Measurement Methods" will confirm the single laboratory results and refine Method 8280 as a rugged regulatory method. The final method protocol would be prepared by October 31, 1985 at the conclusion of the familiarization period. The multi-laboratory portion of the confirmatory study would be initiated in October, 1985 and concluded by December 31, 1985. Funding of the multi-laboratory portion could be shared by both the EMSL-Las Vegas and the CLP. The multi-laboratory study and the remainder of the FY-86 dioxin work will be outlined in a OSW-ORD work plan prepared in August, 1985.

The above schedule leaves an interm period from date of dioxin rule promulgation to the end of calender year 1985 where the agency will not have finalized the dioxin method. During this period the Methods Program would distribute the revised Method 8280 that will be used in the confirmatory study. The distribution would include printing in my periodic "Methods and QA" memorandum and also making copies available to interested persons attending "The Solid Waste Testing and Quality Assurance" symposium. Once a final method protocol has been prepared in late October, the Methods Program will prepare a technical amendment to the Federal Register reflecting the required modifications of the current Federal Register published Method 8280.

cc: Mike Cook
Jim Cummings
Steve Lingle
Matt Straus
Alan Corson
Eileen Claussen
Stanley Kovell
Douglas Gillard
Francine Jacott
Stephen Billets
Florence Richardson

Appendix: Review of Report "Single Laboratory Evaluation of the RCRA Method for Analysis of Dioxin in Hazardous Waste.

The above referred report has been reviewed and discussed by staff of the Methods and Listing Programs and the Dioxin Task Force. As a result of these discussions several recommondation were made. The following details these recommondations.

1. Detection limit calculations require more discussion as to how they were obtained. Projected detection limits need to be verified by samples fortified at concentration levels near the detection limits. Documented detection limits of 1 ppb for all matrices are desired. While somewhat higher detection limits may turn out to be acceptable for complex matrices (still bottoms), the high fortification levels used in this report, make projecting current method detection limits difficult to predict.

2. The Method needs to be evaluated using a larger sample set to insure that the matrices used are representive of the method's proposed application. Currently, all evaluation data is based on 5 samples (1 sample from each of 5 matrices). As one source of additional samples, the Listing Program has agreed to provide the wood preserving samples listed in Table I. Because the results obtained from the analysis of these samples will be used in the Listing Program, the analyses will have to be completed within 6 weeks from the time of sample receipt.

3. Method 8280 needs to be rewritten and tightend by limiting the number of options. The numerous options given for sample extraction are confusing. The method refers to a methanol: petroleum ether: water extraction but the report doesn't evaluate the systems performance. A steam distillation/extraction is also discussed but no information is given when this system is used instead of the methanol: petroleum ether: water system. The method refers to "recommended solvents" but the solvents are not identified. Because 8280 will have general application, a ground water and aqueous waste extraction technique has to be included.

4. The carbon column clean-up section needs to be included in the general method. Extraction steps and washes should not be repeated in the column section. If possible, a single alumina column procedure should be used for all matrices.

Currently two different alumina columns and elution schemes are used. The general method indicates that the carbon column is used after the HPLC-reverse phase step. The need for HPLC-reverse phase followed by carbon column, however, is not demonstrated. The carbon column's preparation and description requires more detail.

5. A brominated dioxin and dibenzofuran determinative method has been requested by the Listing Program. In response to this request, the feasibility of extending Method 8280 to the brominated compounds needs to be investigated. The feasibility report should include background information, the amount of experimental work required and a projection of the project's duration. Information on the compounds and matrices of concern to OSW will be provided by Howard Fribush of the Listing Program.

In summary the following additional work is requested: 1. additional performance data, including detection limits,on representive matrices, 2. an aqueues matrix extraction step, 3. intergration and condensing of the cleanup steps, and 4. a feasibility report on the extension of Method 8280 to the brominated compounds.